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EARLY DETECTION OF BREAST CANCER: A FACT-FINDING METROPOLITAN SURVEY.¹

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In Australia approximately 1000 women die annually from cancer of the breast. It is a commoner cause of female deaths than cancer in any other site, and it exceeds in importance as a killer diabetes, hypertension and all forms of tuberculosis. In Table I, kindly prepared by Dr. H. O. Lancaster, breast cancer is seen to have been responsible for one in 14 of the female deaths in the 45 to 54 years age group during the quinquennium 1946-1950. It has been estimated to attack about one woman in 25 at some time in her life.

Among the present sample of Sydney women surveyed, 17% knew of blood relations with breast cancer, and a further 39% had had friends or acquaintances who had undergone breast amputation or had died from breast cancer. Most women sensed the danger; one unreservedly

said: "I'm terrified of breast cancer; several of my friends have had it and all have died."

The present survey began as an offshoot of a study of post-mastectomy lymphœdema being undertaken in this unit. Control data concerning the circumference and volume of the upper limb were being obtained in healthy women of the cancer age groups. As a routine they were questioned and examined to exclude breast disease. It quickly became apparent that information of interest to students of breast cancer was forthcoming. The survey is of limited extent in respect of the number of subjects interviewed, but it is unlikely that the general trend of the results would be significantly changed, even if it was greatly extended.

The Women Surveyed.

Table II shows the distribution by age of the 284 women surveyed, compared with that of a group of 211 Royal North Shore Hospital patients with breast cancer. The former were somewhat younger; as they progressed through the breast cancer age, an unknown number would presumably develop the disease.

Our survey sample was constituted from five sources. Members of regional bowling clubs and their friends (140) attended when volunteers were called for by their club secretaries. These were mainly middle-aged and elderly women. The remaining 144 subjects were members of the hospital auxiliaries or friends of members (19), hospital office and secretarial staff (28), laundry staff, cleaners and wardsmen (21), and sundry hospital patients with

¹ Work done in the Bonamy Laboratory under a grant-in-aid from the New South Wales State Cancer Council.

TABLE I.
Deaths from Breast Cancer and Other Important Causes in Australia as a Percentage of Deaths from All Causes: Females, 1946-1950.

Age Last Birthday. (Years.)	Cancer of the Breast.		Diabetes.		Cancer of the Uterus (Cervix and Body). ¹		Hypertension. ¹	
	Number of Deaths.	Percentage of Total Deaths.	Number of Deaths.	Percentage of Total Deaths.	Number of Deaths.	Percentage of Total Deaths.	Number of Deaths.	Percentage of Total Deaths.
0 to 4	—	—	5	0	0	0	0	0
5 to 14	—	—	23	1.4	0	0	1	0.1
15 to 24	2	0.1	38	1.5	11	0.4	4	0.2
25 to 34	88	2.0	52	1.1	66	1.5	14	0.3
35 to 44	426	6.0	73	1.0	270	3.8	54	0.7
45 to 54	980	7.2	232	1.7	630	4.6	95	0.7
55 to 64	1288	5.3	1008	4.1	867	3.6	113	0.5
65 to 74	1159	3.1	1808	4.8	728	1.9	196	0.5
75 and over	940	1.5	1478	2.3	435	0.7	305	0.5
Unspecified	—	23.0	2	—	—	—	0	—
Total	4883	2.9	4719	2.8	3007	1.8	782	0.5

¹ Cervix and body of uterus cannot well be separated in official statistics; also some hypertension deaths may be classed with others.

non-breast conditions (76). Nearly all the women resided in the Sydney metropolitan area. All had volunteered to take part in the survey. It is admitted that women with large families would be unlikely to seek employment in a hospital or to have much leisure for voluntary auxiliary work or bowls, and this important group may be insufficiently represented in our material. The hospital patients were nearly all suffering from so-called acute illness not likely to have affected their past marital, gestational or lactational data. This group consisted mainly of the wives or widows of weekly wage earners and manual workers in the lower income scale. Any woman attending the clinic for an opinion regarding known or suspected breast disease was excluded.

Though many of the women surveyed were hospital employees or patients, none had any special contact with clinical material likely to bias her answers to questions or give her special knowledge of the breast cancer problem. As a further check on this, the results in the bowlers and their friends (140) were compared with those in the remainder of the subjects (144) who had had some direct or indirect association with the hospital. No marked or systematic difference was found between the data from the two groups. We may accept this as evidence that the trends revealed in the survey are reliable.

Results and Discussion.

Ætiological Factors.

Interestingly enough, cancer of the breast is comparatively infrequent in societies where marriage is early, fertility is high and breast feeding is the rule. For example, its frequency in Japanese women, who are prolific and who breast feed, falls in the older age groups to only

about one-tenth of that in United States women (Dorn, 1952). Similarly within the Western countries, breast cancer is commonest in unmarried women, and among the married it decreases progressively with increasing fecundity; the matter is well reviewed by Haagensen (1956).

Marital, gestational and lactational data from our survey fall into the typical Western pattern, the women tending to marry late and to have few children, which they often do not nurse fully. The data may be tabulated as follows:

Number of women surveyed	284
Married or widowed	91%
Average age at marriage	24.7 years
Percentage never pregnant	20.8
Percentage pregnant, with live births numbering:	
0 to 2	50
3 to 4	24
5 to 6	4
7 or more	1.2
Total number of live births (average in women married—2.1)	533
Total number of miscarriages and still-births ¹ (average in women married—0.6)	153
Mothers with live infants not breast-feeding ..	4.6%
Mothers with unsatisfactory, defective, or interrupted breast-feeding of one or more infants	44.4%
Mothers breast-feeding all their infants fully for six months or more	51%

Early Detection of Breast Cancer.

There is a strong suggestion—the case is still far from proven—that the operation of radical mastectomy as applied in the past has had a disappointingly small influence on

¹ Includes infants born alive, but dying within five days.

TABLE II.
Distribution by Age of the Women Surveyed and that of a Group of Breast Cancer Patients, Undergoing Radical Mastectomy, Royal North Shore Hospital, 1946-1956

Subjects.	Age Group (Years).											Total.
	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 and Over	
Survey (284)	5	20	27	32	44	37	45	30	24	15	5	284
Breast cancer patients (Royal North Shore Hospital) (211)	1	11	14	15	18	22	28	40	23	27	12	211

the long-term survival of women with breast cancer (Park and Lees, 1951; Douglas, 1957; Grant, 1957). Is all the treatment therefore useless, and is the early detection of breast cancer futile? Few doctors with responsibility for patient care would affirm this. Indeed, our clear duty as clinicians is to keep trying; each one of us must strive towards the earlier detection of cancer, so that his patients can be given the full opportunity offered by modern treatment. But do we so strive?

The women surveyed were asked to state approximately how often they had consulted a doctor during the previous five years, and at how many of these consultations inquiry and examination of the breasts had been made. Visits specifically paid because of breast symptoms were excluded. The distribution of the patients according to the number of visits is shown in Table III. The data have not been biased by the inclusion of a large number of visits over short periods in respect of a few illnesses. In fact, 59% of patients had sought 10 or fewer consultations over the previous five years.

The total number of consultations was approximately 2800. On 56 occasions the breasts had been examined, in 46 patients once, in five patients twice during the five-year period. On two occasions, self-examination had been discussed and taught. Since the breasts were examined at only 2% of consultations, it may be concluded that this step is generally omitted from the routine physical examination as carried out by practising doctors.¹ This is so despite the fact that breast cancer is common and that the breast is an external organ in which even small lumps are relatively easy to palpate. Undoubtedly there

TABLE III.
Distribution of Survey Subjects According to the
Number of Consultations in the Previous Five Years.

Number of Visits. ¹	Number of Patients.	Percentage of Total.
0	8	2.8
1 to 5 ..	98	34.5
6 to 10 ..	61	21.5
11 and over	117	41.2
Total ..	284	100.0

¹ Total, 2800 approximately.

are good opportunities here for early cancer detection; for obstetricians, gynaecologists, chest doctors and cardiologists especially it would be comparatively easy to include the breasts in their routine examination. In this connexion, one of us (F.F.R.) can cite the case of a patient undergoing staged thoracoplasty for bronchiectasis in a London teaching hospital before the last war. As her treatment was nearing completion, a newly appointed house surgeon inquired when the lump in her breast would be dealt with. She was found to have a hitherto unsuspected carcinoma of the left breast with palpable axillary nodes.

Obviously, when breast examination is part of the routine physical examination, more carcinomata will be discovered in patients unaware of their presence than when it is not.

In the United States it appears that more emphasis is placed on early cancer detection than in other Western countries, and this difference is reflected in the figures given in Table IV. Indeed, at the present time we Australian doctors are leaving the task of detecting potentially fatal breast lumps to our womenfolk. Also they discover them by chance and are not taught to do so by regular self-examination.

¹ All visits at which a general examination would seem not inappropriate were included in the total; but those for such minor local conditions as cut finger, foreign body in the conjunctival sac, paronychia etc. were not. Febrile illnesses were included, because it would be good medical care to carry out a general examination after the acute phase of the illness had subsided.

Three groups of doctors, two in widely separated country towns and the third in Sydney, have been questioned directly. Five out of 42 said they tried to include the breast in their routine general examination. Women doctors may be the more thorough in this respect.

Reasons given by the generality of doctors for not examining the breast as a routine were as follows: (i) Time would not allow of it. (ii) The practice would lead to cancerphobia in neurotic patients, and this would outweigh any good done to others. (iii) Such a routine, especially if practised by but one of the doctors in a country town, might excite comment and unfavourable

TABLE IV.
Symptomless Breast Cancer Found on General Examination.

Series.	Number of Patients.	Number in Whom Cancer was Found by Doctor.	Percentage of All Patients.
Haagensen, personal series, 1943-1954	546	50	9.2
Presbyterian Hospital, 1915-1942	1033	61	5.9
Truscott, 1947	787	1	0.1
Kaas, 1948	500	4	0.8
Royal North Shore Hospital, 1947-1956 ..	211	1	0.4

gossip. (iv) It would be productive of much needless biopsy surgery, as so many doubtful lumps would be found. It is noteworthy that none suggested that earlier detection of breast cancers would not follow, or that a better opportunity of curative treatment would not thereby result.

The Lay Woman's Point of View.

It should be emphasized that women approach the subject of breast examination with modesty. They may fear cancer, but in the absence of symptoms, they hesitate, as they sit in his consulting room, to ask the doctor to examine their breasts. Some have even told us that they were reassured by his lack of concern and omission of breast examination.

By contrast, among the women themselves, there was a surprisingly high level of knowledge and interest in breast lumps. They were first asked: "What would a woman with a breast cancer be likely to complain of when she went to her doctor?" When the reply included "a lump", they were then asked: "Would the lump be painful or painless?" The replies may be tabulated as follows:

Lump	72%
The lump may be painless	37%
Pain in the breast	23%
Other symptoms (including discharge from nipple, indrawing of nipple, change in shape of breast, general swelling and hardening, discoloration of overlying skin) ..	22%
"Don't know"	16%

It is of interest that of the Royal North Shore Hospital breast cancer patients (Table I), 89% had noticed a lump in the breast. The other symptoms mentioned by the women surveyed had, of course, also been complained of, and the women surveyed had learnt of these symptoms mainly by word of mouth, from the friends or relations of sufferers. A minority had read articles or pamphlets on the subject. Until recently there has been little public effort in cancer education, but the great majority of women have nevertheless been sufficiently interested to acquire some knowledge of the symptoms.

The next question was: "Is cancer of the breast curable or incurable?" The replies were as follows:

Curable	74%
Incurable	11%
"Don't know"	12%

There was thus a very optimistic outlook on prognosis and treatment. No fewer than 69% replied that the disease was curable if treated early.

To the question "Do you examine your own breasts?", 100 women (35%) gave an affirmative reply. In 18% the examination was done only occasionally or perfunctorily. But 17% examined their breasts regularly by palpation in the bath, or in bed, or under the shower.

Those who examined their breasts regularly were influenced to do so by the loss of a friend or relative who had discovered a lump, or because they knew someone who had had the breast removed under similar circumstances. The highly significant fact emerges that a not inconsiderable proportion of our womenfolk examine their own breasts with the possibility of a "lump" in mind. In most cases the examination is unsystematic, and when done regularly it is often done with unnecessary frequency (one woman examined herself each day and many others examined twice weekly).

Self-Examination as a Health Measure.

If our womenfolk are aware of the problem and are reacting in this way, should we not guide and teach them how to carry out their examination efficiently? It is a recent but, we believe, sound development that we should train womenfolk (except those obviously neurotic) to examine their breasts once each month, after the cessation of the menses.

This need be done only by women over the age of 30 years. The examination is best done in the morning, so that if anything unusual is detected, the patient does not spend the night sleepless, but can at once report to her doctor. Breast self-examination should be regarded not as a morbid trait, but as a positive health habit, giving a continuing reassurance against late detection of cancer. Moreover, because breast cancer is about four times as frequent in such women, self-examination is especially necessary if there is grossly evident cystic disease, a family history of breast cancer, or a previous history of amputation of one breast.

Summary.

1. Cancer of the breast is responsible for approximately 1000 deaths annually in Australia, and it is the most frequently fatal cancer in women.

2. Two hundred and eighty-four Sydney women have been surveyed, data relevant to breast cancer being obtained. Their marital, gestational and lactational habits conformed to the typical Western pattern, their marriages being late, and children being few in number and often not fully breast-fed.

3. Inquiry relating to the breasts and examination of them are almost always omitted from a routine physical examination as it is carried out at present. This results in a low percentage of doctor-detected breast cancers in our hospital patients undergoing mastectomy. It may also give the patient a feeling of false security.

4. Over 70% of the women surveyed knew that breast cancer might reveal itself as a lump, and nearly 40% knew that the lump might be painless.

5. One-third of the women examined (palpated) their own breasts regularly or occasionally. Over 40% had had a friend with breast cancer, and in 17% the disease had affected a blood relation.

6. Over 70% of patients believed that breast cancer was curable if treated early.

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THE PRESENT STATUS OF DIRECT ARTERIAL SURGERY FOR OBLITERATIVE ARTERIAL DISEASE.

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THE successful repair of arteries has been an elusive surgical goal for generations. Sporadic reports of success have appeared in the literature since the classical experimental studies of Carrel 50 years ago, but these results were insufficient to inspire general confidence in the outcome of arterial anastomosis.

Interest in arterial reconstruction for obliterative arterial disease has developed only in the last decade. Continental surgeons were the first to ignite this interest, beginning with the development of arteriography by Moniz (1927) and dos Santos (1929). In 1940, Leriche described the clinical syndrome of thrombotic occlusion of the abdominal aorta, to which his name is given. A new appreciation of the segmental and frequently localized nature of *arteriosclerosis obliterans* led Boyd *et alii* (1949) to propose a classification based upon the clinical features and localization of the obliterative process, rather than upon a predominant histological feature. Dos Santos in 1947 had already begun a direct surgical attack on these segmental lesions with the operation of thromboendarterectomy.

In America, Carrel's original experiments with artery preservation were extended by Hufnagel (1947) and by Gross, Bill and Pierce, who in 1949 published successful results with stored human arterial grafts in the repair of aortic coarctation. The successful resection of a thrombosed aortic bifurcation with homograft replacement by Oudot (1951), in Paris, has been followed by widespread adoption of techniques for arterial reconstruction in occlusive arterial disease. Rapidly growing clinical series have been reported by De Bakey and his group, and by Linton and many other American surgeons. In England the largest clinical experience has been reported by Rob and Eastcott.

The most notable addition to the pioneer methods of Carrel (Carrel, 1902 and 1908; Carrel and Guthrie, 1906) was the successful introduction of artificial prostheses for arterial replacement by Voorhees, Jaretski and Blakemore (1952), who used tubes of vinyon-N cloth. Earlier experience with rigid tubes of silver (Tuffier, 1915) and other materials had been unsatisfactory. Hufnagel (1955) and Kinmonth, Taylor and Lee (1955) reported experimental and clinical success with orlon prostheses. In the past few years a mountainous volume of published material has accumulated, survey of which is beyond the scope of this communication. Search for a satisfactory vessel substitute has led to experiments with autologous, homologous and heterologous grafts, prepared fresh, fixed, frozen or freeze-dried, and with an awesome multitude of prostheses, animal, vegetable or mineral, ranging from tubes of steel mesh, leather and skin to almost every plastic substance so far discovered.

It is proposed briefly to consider those methods which have reached the stage of clinical application in obliterative arterial disease.

Materials of Choice for Artery Replacement.

Of the materials derived from blood vessels, autologous veins and homologous arteries are the only ones applicable at present. Heterologous arteries from other animal species have been unsatisfactory as vascular implants, because of rapid degenerative change (Creech *et alii*, 1954; Sauvage and Wesolowski, 1955).

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Venous Autografts.

Following Carrel's experimental work, Lexer in 1912 was the first to report successful clinical results with venous autografts. In the first World War attempts at arterial repair were generally unsuccessful because of wound infections (Makins, 1919); but successes continued to be reported with vein grafts after aneurysm resection, Weglowski (1925) reporting 40 successes from 51 grafts. Little interest was shown in artery grafting during World War II. De Bakey and Simeone (1946), in a study of 2471 arterial injuries in American casualties, found that vein grafts had been employed in 40 cases, failing to avert amputation in 23. Many of these vein grafts were applied with a non-suture technique (Simeone, 1947). Grafting was used far more frequently in the Korean war (Hughes, 1953; Jahnke and Seeley, 1953), and Hughes considered that venous autografts were more successful than arterial homografts. Excellent long-term results have been reported by Lord (1957) with autologous venous grafts. Experimental data demonstrating dilatation and rupture in aortic replacement are probably not significant in femoral and popliteal replacement. Simeone reports vein grafts successful for as long as six years, with no evidence of dilatation or degenerative changes. The "arterialization" seen in the venous component of arterio-venous fistulae suggests that a successful vein graft may undergo some hypertrophy and metaplasia to arterial character.

The advantages of venous autografts are that they behave as true living grafts, no artery bank is necessary, and long-term results are available to demonstrate their success. Their disadvantages are as follows: (i) They are not applicable to arteries larger than the femoral. (ii) A longer incision and considerable increase in operating time and tissue trauma are required in comparison with exogenous implants. (iii) A vein of suitable size and length may not be available, especially if it is required to bypass a long occluded arterial segment. (iv) Disparity in size may become troublesome if a long vein graft is needed, for it has to be reversed, so that the valves do not impede blood flow.

Arterial Homografts.

The development of satisfactory methods of artery preservation by Gross *et alii* (1949) and by Eastcott and Hufnagel (1950) has led to the widespread establishment of artery banks, to provide a supply of stored arterial homografts for artery repair. In the treatment of occlusive arteriosclerotic disease, arterial homografts have so far proved to be the most satisfactory vascular implant (Linton, 1955). They can be regarded as protein prostheses rather than as true grafts, because all cellular viability is lost and they are invaded by proliferating host tissues. However, extracellular fibre continuity, in the form of elastic fibres, has been shown to survive for at least two and a half years (Creech *et alii*, 1956), and this is probably the most important single attribute of arterial homografts. The excellent clinical results reported by De Bakey and his co-workers (Crawford and De Bakey, 1955; Creech *et alii*, 1954 and 1956; De Bakey and Cooley, 1954; De Bakey *et alii*, 1957), by Linton and co-workers (Linton, 1955 and 1957; Linton and Menendez, 1955), and by Humphries *et alii* (1957) have not been equalled with other graft materials. Satisfaction with arterial homografts is by no means uniform, however, as is shown by the report of Szilagyi, Whitcomb and Smith (1956). Although the general experience is satisfactory with large artery grafts, a high incidence of secondary thrombotic occlusion has been described in grafts to arteries smaller than the common femoral. To account for the variable results, the relative importance of clinical selection, operative technique and homograft preparation must be considered, and insufficient data are available in most reports for this evaluation. The differing estimates of the incidence of late degenerative phenomena suggest that methods of homograft preparation and preservation may be an important variable. No conclusive experimental evidence is available to identify the superiority of the various methods of preservation, but it seems significant that the best reported clinical results have been with the

use of lyophilized grafts. This impression finds support on theoretical grounds from the studies of Sawyer and Pate (1953) on the role of bio-electric phenomena in causing intravascular thrombosis.

Arterial homografts have the advantage that they can be available in any size and length that would ordinarily be required, and they have mechanical properties identical with the host artery. Their disadvantages, however, are as follows: (i) Procurement of suitable donor material, sterilization and storage are difficult, time-consuming and expensive. (ii) Occasional disasters from graft necrosis have occurred, apparently from unrecognized faults in preservation or inadequate sterilization. (iii) In aortic replacement there may be difficulty in matching the size of the host aorta, especially if it is dilated. (iv) The incidence and importance of late degenerative changes have still to be evaluated.

Prosthetic Materials.

A vigorous search for a satisfactory material for a vessel substitute has so far failed to produce an ideal prosthesis. A successful synthetic product would obviate the need for an artery bank, would be readily available in any desired shape or size, could be sterilized with certainty and would not be subject to necrosis in the presence of infection. The ideal properties for an arterial prosthesis may be enumerated as follows: (i) It should be non-thrombogenic. (ii) It should be flexible, maintaining its tubular form on bending. (iii) It should possess elasticity, to allow the elastic recoil which is important for optimal blood flow through large arteries (Wiggers, 1949). (iv) It should not be subject to fatigue or dilatation. (v) It should be impervious to blood. (vi) It should excite no unfavourable host reactions. (vii) It should be easily sterilizable. (viii) It should be inexpensive and readily available, and have satisfactory handling properties for vascular suture.

No prosthesis has yet been discovered that fulfils these criteria. The plastic mesh and cloth prostheses depend upon fibrin formation to prevent leakage of blood, and the rare occurrence of an acute fibrinolytic syndrome may give rise to free haemorrhage from the implant. They are more difficult to sew than homografts, are practically rigid when filled with blood and tend to wrinkle or kink at the anastomotic sites, especially if placed near a flexion area such as the groin or knee.

In spite of these limitations, gratifying success has been achieved with plastic implants for the aorta. Rob (1956) has expressed his preference for plastic prostheses for arteries larger than the external iliac. Hufnagel (1955) and Schumacker *et alii* (1955) have demonstrated their value in aortic replacement. Kinmonth has replaced 11 aortic aneurysms with orlon cloth prostheses, with two post-operative deaths from renal failure, and the remaining nine have continued to function satisfactorily. Of all the plastic prostheses so far described, tubes fashioned from compressed polyvinyl alcohol sponge most nearly satisfy the mechanical properties of the ideal prosthesis. They retain a tubular form, are relatively flexible and elastic, are impervious to blood, and have satisfactory handling properties for vascular suture. Satisfactory results have been described by Mortenson and Grindlay (1956), Robb (1956), and others. However, of all the plastic prostheses that have been used clinically, the worst reports have appeared with the use of polyvinyl alcohol sponge (Harrison, 1957, and Deterling, 1957). This may be due to variations in manufacture of the implant, for a variety of techniques are used for fashioning suitable tubes from the porous, uncompressed sponge. It would seem that further experimental work is necessary to identify the cause of the failures reported before this material can be adopted with confidence for clinical use.

Of the materials that can be used for aortic replacement, good results have been obtained with orlon, nylon, dacron and teflon. No prosthesis is yet as satisfactory for vessel replacement below the level of the iliac arteries as arterial homografts, although the crimped nylon tubes devised by

Edwards and Tapp (1956) to provide flexibility have had some early success.

Methods of Artery Reconstruction in Obliterative Arterial Disease.

Thrombo-endarterectomy, introduced by dos Santos in 1947, was the first direct surgical approach to the problem of arterial occlusion. Many surgeons have recorded their experience with this procedure, including Leriche and Kunlin (1947), Fontaine and Hubinot (1950), and Reboul and Laubry (1950). The relatively high incidence of secondary thrombosis following this procedure has discouraged its wide application. However, in a small series of carefully selected localized occlusions of large vessels, Rob has reported excellent results. Cannon and Barker (1955) have adopted endarterectomy as the method of choice, and in a series of 116 arterial reconstructions performed this procedure in 113, grafts being necessary in only three. They have recorded a negligible incidence of secondary thrombosis for as long as four years after operation (Cannon, 1956). Recently Cockett has begun to extend his indications for this procedure and believes that it may deserve wider application.

The formation of a new main arterial channel by a graft or prosthesis has become the most widely adopted procedure. Excellent results in large series of cases have been published by De Bakey's group, Linton, Humphries and others. It can be stated that the results of large vessel replacement, from the aorta to the common femoral artery, are successful in a very high proportion of cases. The results of femoro-popliteal replacement are less favourable in most reports, although De Bakey has described a success rate of 90% (1957). Szilagyi, Whitcomb and Smith (1956) reported late failures in nearly 50% of femoro-popliteal grafts, while Warren (1956) observed late closure in nearly 70%.

The most disappointing results in femoral homografts have followed excision of the artery with end-to-end replacement. Cockett, following initial success in 10 such grafts, observed late closure in all but one during the next four years. In 1953 he introduced a modification of Kunlin's (1951) technique with venous grafts, employing arterial homografts to produce a bypass, with an enlarging end-to-side anastomosis above and below the occluded segment. It was felt that such an anastomosis might discourage late stenosis of the anastomotic site, which had been observed to precede closure of the end-to-end grafts. Further advantages of the bypass procedure (aptly named by Morris and Barnett, 1955, "collateral" grafting) are reduced operative trauma and minimal interference with the existing collateral circulation, so that graft thrombosis would not cause disastrous results. Cockett's subsequent experience supports the validity of this concept, and the technique has been adopted by Linton (1955), Crawford and De Bakey (1955) and others with excellent results.

Considerations in Operative Technique.

Although aorto-iliac grafting is a major procedure, bypass grafting of the femoro-popliteal trunk should cause no more stress to the patient than a herniorrhaphy. However, few operations demand greater vigilance and painstaking care on the part of the surgeon, if acceptable results are to be achieved.

The responsibility for the suitability and sterility of the graft is great, and all vessels from a graft bank should be checked by histological and bacteriological examination at the time of initial preparation and at the time of use. Fastidious asepsis is imperative. Implanted foreign material is especially vulnerable to infection, giving rise to anastomotic rupture, graft necrosis or septicæmia. Experience has shown that the prophylactic use of antibiotics will not compensate for imperfect aseptic technique.

The requirements of anaesthesia are simple, yet vitally important for success. The maintenance of a stable blood pressure both during and after the operation is essential, for hypotensive episodes are likely to be accompanied by secondary thrombosis.

The actual technique of arterial suture varies in different centres. Carrel's principle of "triangulation" with intimal everting sutures has been generally replaced by a simple end-on continuous suture with two opposing fixed points. More important considerations in arterial suturing are the precise spacing of sutures that do not cut out, yet have sufficient tension to provide a blood-tight anastomosis. This is a difficult feat when the host artery is sclerotic and friable, and Cockett's use of a small sleeve of the graft material placed around the anastomotic site in such circumstances has very satisfactory results.

The introduction of heparinization to vascular surgery by Murray (1940) was at first considered essential for a successful result. However, the high incidence of troublesome secondary hæmorrhage has led to waning enthusiasm for its use. Regional heparinization with dilute solutions is valuable to prevent clot formation in occluded arterial segments during surgery, but post-operative heparinization is not recommended. It is specifically contraindicated when a mesh prosthesis has been used, but Cannon considers it important for good results with endarterectomy. Further experience is necessary to evaluate long-term anticoagulant therapy in these cases, as practised by Rob, in an effort to reduce the incidence of further thrombotic sequelæ.

Indications for Direct Arterial Surgery in Obliterative Arterial Disease.

In evaluating the place for direct surgery in arterial occlusion it is important to distinguish between the following two main groups of presenting symptoms: (i) intermittent claudication; (ii) symptoms of incipient or actual tissue necrosis, such as intractable "rest" pain, ischæmic ulceration and gangrene. This arbitrary separation is made because intermittent claudication does not, by itself, threaten life or limb. The natural history of intermittent claudication, investigated in an excellent study by Barnett and St. Clair (1956), shows that, although the pathological picture is presumably progressive, frequently the clinical picture is not. They showed, during a five-year observation period, that in 50% of patients the symptom remained unchanged, that 25% deteriorated, but that the remaining 25% experienced spontaneous improvement. Claims for the efficacy of other forms of treatment for intermittent claudication should be assessed in the light of these data. Most reports suggest that this symptom is not often relieved by sympathectomy. Boyd *et alii* (1951) have found that Achilles tenotomy, the *triceps suræ* being placed at a mechanical disadvantage, offers relief for calf claudication without serious functional disability. The rationale and value of amnion grafting, lately introduced by Troensegaard-Hansen (1956), have yet to be evaluated.

As the symptom of intermittent claudication is no threat to the patient's life, arterial surgery should be advised only under the following circumstances: (i) When the patient is severely handicapped. (ii) When an increase in the patient's walking capacity is desirable. (For example, it is obviously unwise to attempt a surgical cure for intermittent claudication in a patient with *angina pectoris*.) (iii) When the claudication is stationary or deteriorating. (iv) When arteriographic criteria suggest that arterial surgery is likely to be successful. This can be anticipated in almost all obstructions of the aorto-iliac trunk, even in the presence of additional occlusions in the distal arteries. In such circumstances, survival of the limb is evidence of the efficiency of the distal collateral circulations, and the increase in inflow pressure that follows relief of an aorto-iliac obstruction produces great symptomatic relief. In the case of femoro-popliteal obstruction, ideal criteria should be present, with a localized segmental occlusion and unobstructed inflow and outflow tracts.

In cases of the third category, with symptoms of actual or impending gangrene, the indications for surgical treatment become less discriminatory, for the patient is threatened with the loss of a limb, and possibly his life. In these circumstances, *angina pectoris* or other systemic diseases do not contraindicate arterial grafting when such

a procedure may prevent a major amputation. Patients in this category often present with signs of cutaneous necrosis or digital gangrene. In such cases lumbar sympathectomy has its most valuable role. Husni and Simeone (1957) have shown that, in patients with a satisfactory response to pre-operative tests of reflex vasodilatation, sympathectomy will be effective in preventing or limiting amputation in every case. If the response to these tests is poor, no benefit will result from the operation in half the cases, in which arterial surgery offers the only hope of saving the limb. If the level of the occlusion is higher than the common femoral artery, direct arterial surgery is the treatment of choice. It is important to remember that in the presence of uncontrolled infection and rapidly advancing gangrene, amputation becomes the definitive treatment.

The proportion of patients with occlusive disease of the arteries suitable for reconstructive surgery is difficult to estimate from published reports. A surprising feature has been the high percentage of patients with thrombotic occlusion of the lower part of the abdominal aorta and the iliac arteries. An occlusion at this high level, which is particularly favourable for arterial replacement, is almost always found in patients with claudication extending above the knee. In addition to claudication of the thigh and buttocks, such patients may complain of impotence from impaired blood flow through the internal iliac artery. In some patients this is the major complaint (Gerbode, 1956), and gratifying relief follows successful arterial grafting.

The suggestion of De Bakey that most patients with symptoms of arterial insufficiency in the lower limbs are suitable for arterial grafting is not supported by general experience. That patients referred to his group for treatment are highly selected is suggested by the fact that the majority of their arterial grafts are aorto-iliac (Cooley, 1957). However, arteriographic studies from various sources (Lindbom, 1951; Mavor, 1956) indicate that the commonest site of occlusion is in the femoral canal. Thus, in Mavor's study, 121 out of 142 patients with lower limb ischaemia had arterial obstruction in Hunter's canal, in 30 the popliteal was involved, while only five had aorto-iliac occlusions. Simeone considers that less than 20% of unselected patients with symptoms of arterial ischaemia are suitable for arterial grafting.

Summary.

The present position of direct arterial surgery in the treatment of obliterative arterial disease has been discussed.

Thrombo-endarterectomy, the first direct procedure to be employed for segmental arterial occlusions, may still prove to be the operation of choice in carefully selected cases. Long-term observations of autologous venous grafts show that they may be eminently successful, but they are limited by the restricted availability of a suitable autologous vein to the replacement or bypass of short segments of the femoral or popliteal artery.

Arterial homografts are more widely applicable than any other form of arterial replacement. The early results with their use are highly encouraging, and although the importance of later degenerative changes requires further evaluation, satisfactory function for at least four years has been reported.

Several plastic prostheses have proved to be successful for aorto-iliac replacement. At present there are none with the mechanical properties of arterial homograft, suitable for femoro-popliteal implants.

In discussing indications for arterial surgery in occlusive arteriosclerotic disease, it is important to consider patients with intermittent claudication alone, which does not threaten life or limb, separately from those with incipient or actual gangrene.

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THE MALADJUSTED PATIENT IN GENERAL PRACTICE.

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THROUGHOUT many journals in recent months, there have been comments on the paucity of published material regarding the handling of the psychologically disturbed patient in general practice.

This paper is an outline of the way in which a general practitioner (B.R.B.) and a clinical psychologist (J.R.E.W.) have worked together on the problems of functional illness. The source of case material is from a large general practice conducted in a new suburban area, where many city workers live, and which is a centre for light industry and race-horse training. The area contains a wide distribution of socio-economic levels. Our liaison in

this setting has been gratifying, and we believe that it is desirable to present the types of problems encountered, and the manner in which cases were handled.

It becomes obvious in general practice, that improved and early management is urgently required to meet the ever-increasing volume of psychological ill-health. Personality conflict and environmental stress are often the resultant of increasing urbanization and concomitant changes in social patterns of behaviour. Apart from the purely medical aspects of this problem, there occurs also massive breakdown in standards of conduct. This is evident by waves of delinquency, diminished church-going and general disrespect for traditional institutions. Social stability is imperilled as the family unit becomes smaller, and the cohesion within this group decays—contacts between three generations of a family have become loose and ill-defined. Family groups now move from place to place more. Social and economic levels are more apt to change. In a non-authoritarian society such as ours, the individual is called upon to make more decisions for himself. These briefly are some of the factors which leave the individual open to increased stress.

The family doctor must of necessity be concerned with these stress problems in his everyday practice, particularly as more and more patients turn to him in his capacity as confidant, friend and adviser. Any means by which he can increase his ability to meet this problem should be utilized to the full.

We are suggesting such a means in this survey—the use of a clinical psychologist in general practice. We believe that piecemeal handling of symptoms, and failure to see the patient as an individual in a total social setting, are fruitless and unrewarding both to patient and clinician.

The Use of the Clinical Psychologist in General Practice.

Many forms of maladjustment are best handled with the aid of a psychologist at general practice level. The family doctor sees the person in his own environment, he knows the person's family and friends, and thereby he can most readily assess the biosocial needs of the individual. From this reference point he can determine when it is desirable to enlist the aid of the psychologist.

There are a large group of patients who are not being adequately catered for under existing circumstances. The disorders of such patients are often too complex for the busy general practitioner to "treat" (as opposed to "handle"), and yet are not sufficiently severe for their management to be undertaken in a setting far removed from the patients' everyday life. These patients are readily recognized. Their invitation card to the consulting room is in the form of symptoms which transparently disguise some form of emotional distress. This may arise from a wide diversity of potential sources of stress—e.g., marital, family, social or employment relationships. With these patients it is easy to establish rapport, for they come eager to speak about their personal relationships and are quick to terminate discussion of bodily discomfort. It must be emphasized that this process is most likely to occur in a situation where the patient feels that he has a sympathetic and understanding listener.

Fears have been expressed that organic disease may be overlooked when non-medically qualified persons are involved in patient management. Provided close liaison is maintained between psychologist and doctor, we have found this attitude unrealistic. It is possible for errors to occur despite the most stringent precautions—this unhappy event may occur at any level of practice. However, far too frequently the opposite obtains—the psychosomatic sufferer is subjected to repeated surgical assault while his original symptomatology becomes more deeply and permanently embedded in his personality. Also, it is held that the medical adviser has not fulfilled his contract when he merely rules out the organic and labels the condition as "functional".

The manner in which the doctor interviews these patients, and the criteria by which he decides whether he shall counsel himself or use the services of the psychologist, will be considered below.

Criteria for Selection of Cases.

If it is thought desirable to refer a patient to a psychologist, we find the following points useful:

1. All attempts are previously made to exclude the possibility of causative organic diseases.
2. It is preferable that the symptoms be of recent onset.
3. There should be a minimum of previous handling by different practitioners.
4. The patient should actively desire psychotherapy. (Introduction to psychotherapy should be conducted on non-directive lines as outlined in this paper, i.e., the patient is "ready" for psychotherapy.)
5. The patient should be psychologically malleable—this does not necessarily correlate with the chronological age.
6. The patient should be of reasonable intellectual level in order to profit from counselling.
7. There should be no obvious signs of psychosis or pre-psychosis.

Diagnosis, and the Function of the Psychologist.

The doctor takes the patient's history with the foregoing criteria in mind. He knows the patient and understands his background. By virtue of his status as a family doctor, he is admirably situated to observe the dynamics of the patient's total situation—his family relationships, his job satisfaction, his aspirations and his recreations. From this the doctor is capable of assessing the nature of the patient's disorder, and the suitability or otherwise of active psychotherapeutic intervention.

The general practitioner can in most instances identify the anxiety state (acute or chronic), the hysterical disorder, the hypochondriases, the depressive reaction, or the normal person suddenly subjected to unreasonable stress.

If in some cases the doctor has been unable to elicit manifestations of pre-psychosis, then in such cases, the psychologist with his test techniques will recognize these features and advise the doctor accordingly. In such cases the patient will profit, for by the early recognition of his disorder, urgent psychiatric intervention can be arranged.

The psychologist makes use of tests of personality structure and of intellectual capacity and efficiency. These tests, such as the Rorschach technique, the Thematic Apperception Test, the Minnesota Multiphasic Personality Inventory and the Bellevue-Wechsler Intelligence Scale, are instruments aimed at accurate psychodiagnostic assessment. The results of these tests contribute to the total diagnostic picture of the patient. They have varied applications, but in this survey are used to cover the following three factors: (a) descriptions of the dynamics underlying the patient's symptoms; (b) indications for prognostic assessment; (c) suitability for particular forms of psychotherapy. The major contribution of the psychologist is the early isolation and identification of the beginnings of more serious ill-health.

In his constant association and familiarity with interviewing and testing techniques, the psychologist will often reach the source of the patient's emotional distress more quickly than those for whom this type of work is only part of their occupation. Also, the psychologist has more time than the average doctor to offer to such patients. Further, by early diagnosis of such cases, speedier results are achieved, and therefore a service can be offered to a larger number of people.

Observations on chronic dependent neurotics suggest that, had early active treatment been undertaken, their hopeless end result might have been avoided. In other instances early intervention might have prevented the hypochondriac from being subjected to needless surgery.

Approach to Treatment.

In this survey, by and large, Rogerian methods of non-directive therapy have been practised by physician and psychologist. This form of counselling allows the patient to uncover sources of conflict. The release of emotional tension which follows in many instances results in the removal of the somatic manifestations of disease. It is not, of course, suggested that "client-centred" therapy is

the only type of treatment, but we have found it to be of considerable value.

In some isolated cases, in which emotional blocking was encountered, it was found necessary to use hypnotherapy in order to overcome resistance. Some other adjuvant methods were used on occasions—e.g., electrical conditioning, etc. In some instances it is desirable for the physician to administer tranquilizers or sedatives at critical phases of emotional unburdening. This point in psychotherapy is usually reached just prior to the patient's achieving insight.

The Introduction of Psychotherapy to the Patient.

The preparation of the patient for psychotherapy is important. Prior to this, as was suggested earlier, a full clinical history is taken and a full examination is made by the doctor before any case is labelled provisionally "psychosomatic". Any relevant investigations are conducted to make the diagnosis absolute. If there is any doubt as to diagnosis, a consultant physician's opinion is sought.

Once it has been decided that the disease is functional in origin, psychotherapy is introduced to the patient in the following manner. No patient is bluntly told "Your troubles are nerves", nor is any patient "threatened" with psychotherapy. The patient is allowed to talk around his problem in a Rogerian fashion. The conversation is directed only inasmuch as "emotion" or "stress" topics are encouraged, whilst irrelevant discussion of bodily function and somatic sensation is discouraged. (As we have stressed, the somatic symptom is often only a pretext by which the patient invites himself to be heard by the doctor.) The manner of the interview closely adheres to the method admirably outlined by Dr. A. Sinclair, of Melbourne, in lectures delivered in Perth in 1956. This is the client-centred (or patient-centred) approach, in which the doctor "holds a mirror" to the patient's feelings. The therapist empathizes with the patient and clarifies his emotional statements. In this way, the patient comes to see his real problems more clearly and achieves insight into them.

Inevitably in one or two interviews of 15 to 20 minutes the patient expresses in some way or other (without being prompted) that his "nerves must be the trouble". At this juncture the doctor asks: "Have you ever thought of having treatment for this?" By enabling the patient to reach this point by himself one by-passes patient resistance, and within a short space of time the patient has practically asked for psychotherapy—i.e., the patient is "ready".

At this point the doctor can decide whether to counsel the patient by himself, or whether to refer him to the psychologist. If such reference is thought desirable, it is then explained that many similar patients ("who were not at all queer") have been helped by the psychologist ("whose tests can often get to the root of the trouble") and that such help can be arranged if the patient so desires. Again, by leaving the decision to the patient, resistance and often prejudice can be by-passed. We believe that one cannot over-estimate the importance of non-directive techniques in this type of introductory and exploratory interview.

The patient is told that the psychologist will interview him, and that he may conduct a test to reveal "underlying causes" of the disability. After one or two interviews by the psychologist, there is a consultation between the psychologist and the doctor, and the patient is then told whether or not it is likely that he will benefit through further counselling. If no benefit is likely, sessions with the psychologist are terminated and the patient returns to the doctor. He reviews the situation, and with the aid of the psychologist's findings determines future avenues of treatment. On the other hand, if the case is suitable, interviews are continued until a solution is reached. (Usually six to eight sessions are required.)

At all stages of this process the patient has made his own decisions, and having assumed this responsibility for himself, the patient is unlikely to become resentful or hostile toward the therapist. Further, by these methods we have found that no patient loses confidence in or contact with the general practitioner, even those patients who are not relieved of their symptoms.

TABLE I.
Analysis of Results in Cases Dealt with from June to December, 1956.

Case Number.	Sex.	Age. (Years.)	Social Status.	Presenting Symptom.	Number of Interviews.		Supplementary Technique.	Outcome.
					Diagnostic.	Therapeutic.		
I	M.	28	Professional; married.	Stuttering.	1	4	Electrical conditioning.	Relieved in the surgery, otherwise unchanged.
II	F.	26	Middle class; married.	Gross hypochondria.	1	3	—	Unchanged.
III	F.	32	Middle class; married.	Frigidity.	1	5	—	Unchanged.
IV	F.	33	Working class; married.	Gross hypochondria.	1	—	—	Unchanged.
V	F.	37	Middle class; married.	Asthma.	1	—	—	Improved.
VI	F.	25	Middle class; married.	Ulcerative colitis.	1	7	—	Relieved.
VII	F.	22	Middle class; single.	Gross hypochondria.	1	—	—	Unchanged.
VIII	F.	27	Middle class; married.	Frigidity and primary inertia.	1	4	Hypnosis and tranquilizers.	Relieved.
IX	F.	27	Working class; married.	Frigidity.	1	7	—	Relieved.
X	F.	28	Middle class; married.	Sex aversion, pregnancy phobia.	1	2	Art therapy.	In progress.
XI	M.	33	Professional; married.	Tension headaches, hysterical paralysis.	1	—	—	Unsuitable.
XII	F.	28	Middle class; married.	Acute situation anxiety.	1	—	—	Relieved.
XIII	M.	32	Professional; married.	Pruritus ani.	Combined DT. ¹	—	—	Unsuitable.
XIV	F.	24	Upper class; married.	Gross maladjustment.	1	—	—	In progress.
XV	M.	24	Professional; married.	Vomiting under stress.	1	3	—	Relieved.
XVI	F.	17	Working class; single.	Acute adolescent maladjustment, hysterical fugue.	1	2	Sedation.	In progress.
XVII	F.	18	Working class; single.	Alopecia areata.	1	—	—	Relieved.
					Combined DT. ¹	—	—	

¹ "DT" = diagnostic and therapeutic.

Results.

Assessment.

In our assessment we have scrupulously refrained from the use of "suggestion" with our patients. We have relied entirely on statements volunteered by them and/or their relatives. When objective signs of somatic dysfunction were present, then the alteration to this sign was used as a guide.

TABLE II.

Definition of Criteria of Results.	Number of Cases.
Condition worse (increase in symptoms)	0
Condition unchanged (neither symptom relief nor insight achieved)	4
Condition improved (partial relief of symptoms, or insight followed by acceptance of symptoms)	1
Condition relieved (remission of symptom and achievement of insight)	7
Unsuitable for treatment (assessed as unsuitable for treatment at out-patient level in this setting)	2
Cases in progress	3
Total	17

Discussion.

Condition Worse.— No patient was made worse or developed any unpredicted complications.

Condition Unchanged.— Although some patients were classified as unchanged, this does not imply that to refer them to a psychologist was unrewarding. For example, in Cases IV and VII, both the patients were hypochondriacs, and information was gained through psychological interview which was of help to the doctor in providing support for an indefinite period. (Both had previously been preoccupied with surgical procedures.) Although most patients at the initial interview have as their "invitation card" a somatic symptom, it would be wrong to classify them all as hypochondriacal; with encouragement most patients will discuss emotional or stress topics. Those with whom one endlessly skirmishes at a somatic level (i.e., those who will discuss nothing but body symptoms) are the true hypochondriacs, and for these a poor prognosis is indicated. Many are unsuitable to be referred to the psychologist.

Condition Improved.— We classify the patient in Case V, an asthmatic, as improved, because she gained insight. She came to realize that her attacks were precipitated by

sexual frustration, the result of her husband's impotence. She has become less fearful of her attacks, and is now content to gain relief for her asthma through tablets instead of demanding injections and sympathy at inconvenient times.

Condition Relieved.— The group of patients classified as relieved comprise half of those whose treatment was concluded during this survey, and this result is most gratifying in every way.

Case III was one of frigidity; the patient had been married for eight years, had four children and had never achieved an orgasm. She was astounded by the speedy relief of her symptom.

Prognostically, too, this was an important result, as it is thought that had psychotherapeutic intervention not been made, this patient would have ultimately deteriorated into psychosis to gain expression for her sexual impulses.

In Case VI, one of ulcerative colitis (present for three years before counselling), the patient's condition dramatically improved and her bowel actions decreased from five per day to one per day in a very short time.

In Case VIII, one of frigidity and primary inertia in both previous labours, the patient was counselled during her third pregnancy. Just prior to achieving insight she became very agitated, but responded to tranquilizers and went on to enjoy sexual relations for the first time. She also went on to enjoy a quick and uneventful labour.

Case XVII was one of alopecia areata in a girl, aged 18 years, who worked as "nursing aid" in a country hospital. Her initial counselling interview with the doctor lasted for 30 minutes and was so successful that the psychologist's help was not required. Six months prior to the onset of baldness she had had a tiff with her boy-friend, who drove off into the night and was killed. She regretted the tiff, and wished that she had been at the hospital to which he was taken. When she realized the significance of this incident, she underwent considerable catharsis and wept profusely. When she was examined a month later, her hair regrowth was almost completed. She was a normal girl subjected to abnormal stress, and required no further treatment.

Unsuitable.— Two cases were classified as unsuitable for this form of out-patient therapy. It was thought that removal of the patients' symptoms (their "safety valve") would precipitate a psychotic breakdown.

Case XIII was one of idiopathic pruritus ani. Despite ample opportunity, the patient did not divulge to the doctor the fact that he had in the past suffered two psychotic breakdowns. (He felt that his profession would be jeopardized if he divulged this to anyone.) Psychological investigation

revealed this previous history, and showed that removal of this psycho-somatic symbol might precipitate further breakdown, and the psychologist advised the doctor accordingly.

The other patient (Case XI), who suffered hysterical paralysis and tension headaches, had never been psychotic, but tests revealed that breakdown would be probable if interference was attempted.

In both these cases it has been of value to be forewarned of the danger of breakdown at a future date.

General Discussion.

In general practice considerable help has been derived by the doctor through utilization of the psychologist's skills. More important, however, is the fact that many patients have been helped who otherwise would have been inadequately handled. Also, through contact with counselling technique, the doctor finds his own ability in this field to be increased.

Psychological tests are frequently a short cut to the understanding of the patient's problems, and are invariably of prognostic aid. Non-directive therapy is an eminently suitable technique for many patients examined in general practice.

It is desirable that reasonable selection of patient material be exercised in order to derive the maximum benefit from the clinical psychologist.

We regret that space does not permit more comprehensive descriptions of cases and their management.

Summary.

1. The need for active psychotherapy in general practice is stressed.
2. A brief description of counselling technique is given.
3. Criteria of suitability for this type of treatment and the use of the psychologist are discussed.
4. The way in which psychotherapy is introduced to the patient is outlined.
5. Brief summaries of some cases are presented.
6. Assessment of results shows the value of this type of treatment.

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TWO DEATHS FROM ANOXÆMIA DURING THE CONSTRUCTION OF A SEWERAGE SYSTEM.

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In a recent issue of this journal ("Current Comment", 1956) there appeared a short article which drew the reader's attention to the ever-present hazards of working in confined spaces, as follows:

Not infrequently tragedies or near tragedies occur in industrial and municipal service when workmen are overcome and intoxicated or asphyxiated by the gaseous contents of pits and tanks in which, by nature of their occupation, they have to work. The suddenness of the onset of unconsciousness and the involvement of bystanders who seek to help prevent the rescue in time of the workmen and would-be rescuers. The inhaled air in the enclosed areas may appear to be innocuous, and ignorance of the physics of ventilation encourages the worker to enter blithely and without apprehension into his own death chamber.

A double tragedy which occurred last year at a country town in New South Wales emphasizes the truth of the foregoing extract.

Effects of Oxygen Deficiency.

The clinical symptoms of oxygen deficiency are those of asphyxia, and their mode of onset is determined by the following three factors: (a) the speed at which oxygen is reduced; (b) the degree of deficiency; (c) its duration.

Under the most adverse conditions a man may quickly become unconscious and die within a few minutes. If the anoxia develops slowly, the mental capacity of the victim gradually deteriorates and he may not be aware that anything is wrong. Henderson and Haggard (1943) describe four main stages of asphyxia. The following is a short clinical description of each phase.

Stage I occurs when the oxygen content of the air is between 16% and 12%. The volume of breathing is increased; the pulse rate is accelerated; the victim's ability to maintain attention and think clearly is impaired; fine muscular coordination is somewhat disturbed.

Stage II occurs when the oxygen content is between 14% and 10%. The higher brain centres are affected; judgement is faulty; severe injuries cause no pain; excessive emotional responses are easily aroused; respiration is frequently intermittent or Cheyne Stokes in type.

Stage III occurs when the oxygen content is between 10% and 6%. Nausea and vomiting occur; the subject may not be able to move; bewilderment and loss of consciousness follow. If the victim is revived, he may be unaware that anything abnormal has happened.

TABLE I.

Percentage of Carbon Dioxide in Inspired Air.	Average Depth of Respiration. (Cubic Centimetres.)	Average Number of Respirations per Minute.	Percentage of Carbon Dioxide in Alveolar Air.
0.04	673	14	5.6
0.79	739	14	5.5
2.02	894	15	5.6
3.07	1216	15	5.6
5.14	1771	19	6.2
6.02	2104	27	6.6

Stage IV occurs when the oxygen content is below 6%. Convulsions may occur; respiration consists of a series of gasps separated by periods of apnoea of increasing duration; the breathing finally stops, although the heart may continue to beat for a few minutes longer.

Patty (1949) states that there is "considerable personal variation in susceptibility to anoxia. Because of impaired compensation men or women with cardiac and pulmonary deficiencies are more susceptible. Hyperthyroid patients normally consume more oxygen and are therefore more susceptible; the reverse is true of hypothyroidism".

Delayed Effects.

Whether or not sequelæ develop depends upon the severity of the episode. In mild cases, delayed effects may be entirely absent, or not more serious than a slight headache. The latter is probably caused by oedema, which raises the intracranial pressure. In severe cases the anoxia may damage the central nervous system, resulting in paralysis; the nature of the disability depends upon the site of tissue degeneration. Prolonged and severe asphyxia may cause pulmonary abnormality; this is especially apt to occur in untreated patients.

Effects of Excessive Amounts of Carbon Dioxide.

Not infrequently an oxygen deficiency is accompanied by a rise in the concentration of carbon dioxide, which causes an increase in the breathing rate. The latter is a protective and compensatory response which, at a certain level, in spite of tremendous over-ventilation, fails to prevent a significant rise in alveolar concentration of carbon dioxide. Figures in Table I illustrate this point (Wright, 1953).

A high blood carbon dioxide level causes a decrease in the cardiac rate; the patient then becomes unconscious and may die.

Previous Deaths from Anoxæmia.

In overseas industrial medical literature it is possible to find details of many deaths which have been caused by a variety of circumstances. It is not our intention to summarize this literature, but we should like to draw the reader's attention to similar occurrences in New South Wales. Some of these have happened in factories, others underground.

Factory Deaths.

In recent years the New South Wales Division of Industrial Hygiene has investigated at least three separate accidents. These are as follows.

1. An employee died while he was cleaning the inside of a vinegar vat which, prior to the accident, had been almost empty for 10 days. When the tank was resealed, in an attempt to reproduce the fatal conditions, it was found that the carbon dioxide content quickly increased to 5%. There also occurred a simultaneous reduction in oxygen content. It is almost certain that the foregoing changes resulted from the accidental introduction of fermenting organisms.

2. Two employees died while working inside a tun at a brewery. Because of insufficient cleaning, sludge was present, and was responsible for the evolution of large amounts of carbon dioxide.

3. Two men were temporarily overcome while working in a vacuum still used for distilling oleic acid.

Deaths Underground.

The following deaths occurred underground.

1. An employee collapsed while inside a small concrete valve check chamber. Subsequent investigations (Department of Labour and Industry, 1956) showed that an oxygen lack could have resulted from water seepage. A considerable amount of hydrated iron oxide had been precipitated on the walls and floor as a result of partial corrosion of water mains, valves, flanges and bolts. The oxygen content of the internal air on one occasion after the accident was found to be as low as 7%, and on another 8%.

2. The annual reports of the New South Wales Department of Mines describe several cases. The following two incidents are typical of the remainder. (i) In 1938 two mine deputies entered a cavity to clear it of inflammable gas by erecting hurdles (Department of Mines, 1938). One man was overcome and died within the hour. An air analysis revealed the composition to be as follows: oxygen 1.1%, carbon dioxide 6.4%, methane 75%, carbon monoxide 0.01%. An interesting point is that at the post-mortem examination the blood of the victim was found to be 70% saturated with carbon monoxide. It was assumed that the lack of atmospheric oxygen allowed the small amount of carbon monoxide present to combine readily with nearly all of the available hæmoglobin. (ii) In 1949 an under-manager and deputy were asphyxiated while inspecting inbye of a fall in old workings (Department of Mines, 1949). They encountered an atmosphere containing only 1.5% of oxygen and 8% of carbon dioxide.

Description of Sewerage Construction Works.

A civil engineering and building contractor had 90% completed a large sewerage system when the two deaths occurred in January, 1956, in the manhole designated as "A5" (see Figure I). The section of the project containing the manhole was located in loamy clay soil and had been completed in about October of the previous year. A5 had an internal diameter of approximately four feet for a distance of 15 feet below the surface; at this point it was reduced to two feet six inches for an additional eight feet. The concrete walls and floor were six inches thick. The surface opening was sealed by a solid cover.

At the time of the tragedy the new section was not connected to the old system. A5 was plugged off at the two manholes on either side. In addition, earlier construction difficulties necessitated blocking the connecting 12 inch line approximately 500 feet away. Although a good job was made of sealing off the section containing the fatal manhole, it is possible that some slight seepage did occur; there was no main flow. We were informed that all the

new work had a small quantity of "water" in the bottom of the channel. Moulds could easily have grown under the prevailing damp conditions and might have been present in this liquid. No analysis was made. However, it is known that there was no appreciable quantity of visible slime or fungus.

Description of the Accident.

From evidence given at the inquest, it is possible to obtain a clear picture of what happened.

The day before the fatalities occurred, another employee was slightly affected when inside an adjacent manhole. He had descended to plug the main entrance, and after working for four or five minutes felt quite giddy. He speedily recovered. Unfortunately the person concerned did not inform the resident engineer; he did, however, discuss it with one of the subsequent victims; they decided to blame the prevailing hot weather.

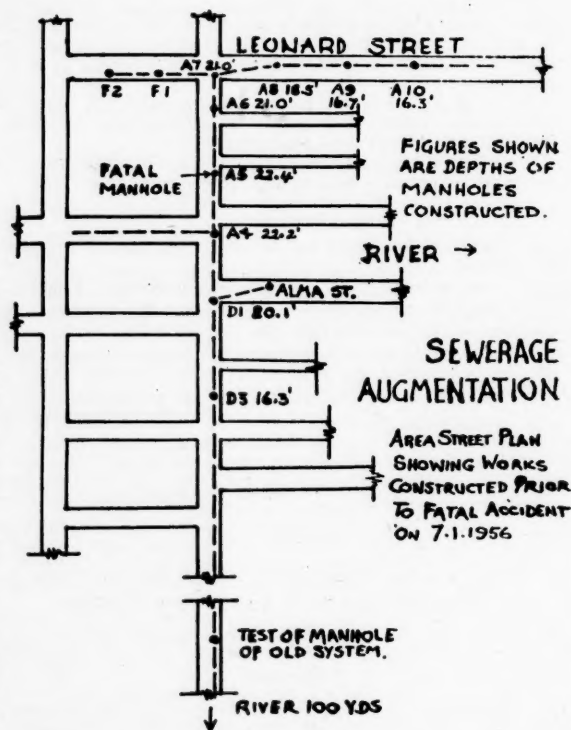


FIGURE I.

At the time of the accident A., an experienced foreman, took a workman, B., into the manhole in order to show where cement rendering was necessary. A. entered first. When B. was halfway down the steel ladder, he detected an unusual smell, "like burning oil", which he had not noticed in earlier descents. This odour irritated his throat. When B. reached the bottom, he turned to his foreman, who was now leaning against a wall, and said in Italian: "Come on, come on up, Boss. Air no good. It's no good to stay here." By the time B. had returned halfway to the surface, A. had made no attempt to follow, but he replied when spoken to. A few seconds later the foreman slumped to the bottom of the pit, and was breathing so heavily that people at the top could easily hear him.

When B. reached the surface he went for a rope; by the time he returned a sizeable crowd had gathered. Language difficulties prevented him from clearly explaining that the air was bad. In the meantime C., a wardman from the local hospital, without any form of protection, bravely descended the manhole in order to try to effect a rescue. Unfortunately he was quickly overcome. About this time a constable, D., arrived at the scene of the accident. After tying a rope round his waist and fixing a damp towel over his mouth, he went into A5. The policeman stated that, when in the vicinity of

the 11 foot level, he noticed a peculiar sweet smell, which became stronger as he descended further. At the bottom the odour was almost overwhelming. The constable was unable to stay down for any length of time, because he began to lose the use of his limbs, became very sleepy and started to choke. When hauled to the surface he was dazed, his legs felt weak and he staggered about. According to observers he was struggling for breath, was pale in the face and his eyes were glaring. On recovery he courageously descended a second time, after inserting a narrow-bore garden hose in his mouth. Once again he noticed the sweet smell. On account of kinks in the tubing and people walking on its free end, difficulties were experienced in obtaining an adequate supply of fresh air. For the second time the constable was adversely affected.

As soon as the resident engineer was informed of the accident, he sent for a portable air compressor, which was quickly put into use. However, before it was possible to do this, another bystander, E., descended, after donning a gas mask which had a hose attached to it. In spite of the respirator the rescuer also noticed the sickly smell. He soon felt weak, and while tying the rope round one of the bodies, had difficulty in breathing. In his evidence this person said that he "had a recollection of leaving the bottom and being hauled up. For part of the way I think I must have been unconscious . . .". On his reaching the surface, his appearance and reactions were similar to those of the constable.

Several bystanders stated that the recovered bodies of A. and C. were lifeless, the eyes were protruding and the extremities, such as finger-nails and tongue, were a dark blue or black in colour. A policeman specifically commented that the rescue rope was not round the neck of either body. At the local hospital artificial respiration and cardiac massage were performed but with no effect.

Post-mortem examination on C. revealed marked congestion of most of the abdominal organs, lungs and cerebral vessels. There were no macroscopic signs of haemorrhage in the brain tissue. A left hydronephrosis was also present. With the exclusion of the abnormal kidney, similar findings were present in A. In the opinions of the local medical practitioner and the Government Analyst, these changes were consistent with deaths from asphyxia.

Carbon monoxide was not found in blood samples taken from both victims. In addition to coal gas, suggestions were also made that inhalation of either hydrogen cyanide or sulphide might have been responsible for the deaths. These possibilities were easily ruled out.

It will be remembered that the rescuers noticed a smell which was frequently described as sweet or sickly. A. was a diabetic, and the view was expressed that the smell was acetone. As this appeared to be a likely possibility, I invited the comments of his practitioner. He replied (Bonwick, 1956) that his deceased patient "was careful on his diet and was free of glycosuria on 12th and 19th December, 1955. It is hard to believe that he had acidosis on the date of the accident. His clothes were wet but I could not smell urine . . .".

Both E. and D. suffered from intense headache after the accident, which, in the case of the latter person, lasted for several weeks and was accompanied by severe insomnia.

Information Gained from Overseas Investigations.

In his summing up the Coroner asked: "Why should a manhole suddenly become lethal?" In trying to answer this question it is important to consider the conclusions of an American article (Michaelsen and Park, 1954) describing the death of a plumber in a manhole in Minneapolis. Subsequent to the tragedy, hourly air tests were taken after the manhole had been blown out. The following observations were made:

The oxygen content dropped rapidly, particularly at the greater depths, from 18.8% . . . to 1.4% . . . Thus in a few hours the oxygen level dropped . . . to a point insufficient to support life . . . Manholes, particularly those in low or swampy areas, are potentially dangerous in respect to oxygen depletion. There may be substances in the subsoil other than vegetable matter which may increase the chemical oxygen demand. There is a free and rapid diffusion of gases through the walls and floors of manholes. The flow of air through manhole cover openings is ineffective under all conditions in maintaining the air within the manhole in equilibrium with the outside air . . .

Other authors have reached similar conclusions.

Extensive American investigations (Jones *et alii*, 1942) over a number of years show that the likelihood of encountering conditions of oxygen deficiency is constantly present. Table II sets out the results of a very large number of air analyses on samples obtained from manholes in Boston and adjacent cities.

The same report states that during the period 1929-1940, 155,765 manhole tests were made; a low oxygen content of the air was found on only 254 occasions.

TABLE II.

Year.	Number of Manholes Tested.	Total Number of Tests Carried Out.	"Soil" Gas, Low Oxygen Content—No Appreciable Quantity of Combustible.
1938 ..	12,927	15,159	8
1939 ..	13,902	16,142	3
1940 ..	15,695	18,450	1
Total ..	42,524	49,751	12

Results and Interpretation of Our Tests.

It is frequently difficult to ensure that samples collected a few days after such a happening will give a true picture of conditions prevailing at the time of the tragedy. Moreover, it should not be forgotten that in this case, within a short time of the accident, a considerable quantity of air was blown into the manhole; in addition, the rescue operations would create further disturbance and dilution. Nevertheless, Table III shows that several tests revealed a deficiency of oxygen.

Samples were collected on two main occasions—namely in January and in June. The latter were obtained by one of us when visiting the area in order to make further investigations. The procedure was to remove the manhole cover and lower the free end of a sampling rubber tube one quarter of an inch in diameter to the bottom or water level. The other end of the tubing was attached to an Orsat apparatus. At the same time a Davy safety lamp was lowered the same distance. Figure I shows the location of the test points.

Most of the manholes tested had not been opened for several weeks; nevertheless, oxygen concentrations were practically normal and carbon dioxide levels were under 1%. Under ordinary weather conditions the internal air would have reached an equilibrium composition with the soil air; but on account of extensive river flooding the ground was full of water to within a few feet of the surface. Consequently, the manholes were probably surrounded with water-filled, instead of air-filled, soil; this would prevent gaseous exchange and, as a result, the internal atmosphere would remain similar in composition to that of the outside air.

Our tests did not throw any light on the question of the rate of exchange of air between a freshly-opened manhole and the surface. However, when the manhole covers were removed, it was obvious that a considerable exchange of air immediately took place. Why?

In summer, the air at the bottom of the manhole is lower in temperature and therefore denser than surface air. In winter the opposite is the case. Table IV compares calculated air densities for (a) the outside air, and (b) an oxygen-deficient atmosphere of a manhole on an average day in January (the month of the deaths), against a typical June day.

In the absence of local data, the air temperature at the bottom of the manhole was determined by curves of subsurface temperatures supplied by the Sydney meteorologist (Research Bulletin, 1943). Because Sydney and the inland town in question have similar average temperatures, it may be safely assumed that temperatures 20 feet below the surface would be comparable. At this depth the yearly average is about 64°F.; this figure would be typical for January and June. A maximum of 66.5°F. is reached in March, a minimum of 61.5°F. in September.

From Table IV it will be seen that for average January conditions the outside air would have a density of 1.182 ounces per cubic foot, against 1.227 for that inside the manhole. Therefore, the air in the latter would not tend to circulate. In June, the corresponding figures would be 1.243 and 1.227 ounces per cubic foot; the manhole air would tend to rise and mix with the outside atmosphere. At standard temperature (32°F.), the outside air would have a density of 1.288 ounces per cubic foot, and the hypothetical manhole air 1.307. From these values, it can be shown that the temperature of the air at the bottom of the manhole must be at least 7.5°F. above outside air temperature for mixing to occur. Under average temperatures, this condition would apply from about late May to early August. For the remaining four-fifths of the year, there would be no tendency for our suggested manhole air to rise. Even were its composition normal, the likelihood of the air's mixing with the outside atmosphere would generally be limited to the period from early April to the end of September. In the hotter months, irrespective of composition, there would be little or no tendency for manhole air to circulate. We believe that the foregoing conclusions, based on "the physics of ventilation" ("Current Comment", 1956) are important.

If the foregoing deductions are correct, they may explain one of Bernardini Ramazzini's observations. In 1713 he wrote as follows:

... at Modena there are well diggers of another sort who dig wells not in summer but in mid-winter; but these are very different from other wells for from them we get springs of living water very pure and very clear . . . they [the wells] are found in various strata, now of chalky now of an ashy earth alternately; . . . work is extremely fatiguing and dirty, for the workmen have to stay in these wells for almost a whole month, in winter, as I have said, for in summer they refuse to undertake this work on account of the reeking exhalations and the intense cold; but in winter they can spend their time there as though they were in a hot room, for great heat is concentrated in the well, there is no exhalation and they can have lights burning which in summer are extinguished by the exhalation of fumes . . ."

Safety Precautions.

The following four safety rules have been extracted from a recent article entitled "Respiratory Hazards to Construction and Maintenance Workers" (Waldram, 1956).

1. Atmospheres are easily tested for gas pollution by gas detectors or even by mice or canaries. These animals are soon affected by toxic conditions and give an indi-

TABLE III.
Results of Analyses of Air Samples.

Date of Sampling.	Position.	Analysis by.	Composition (Percentage).					Level at which Samples Taken. (Feet.)	Remarks.
			O ₂ .	CO ₂ .	CO.	H ₂ S.	CH ₄ , H ₂ etc.		
9.1.56 ..	A5 manhole, Lachlan Street.	G.A. ¹	17.5	1.0	—	—	—	—	These five samples appear to be practically normal air.
	A5 manhole, Lachlan Street.	G.A.	18.8	0.1	—	—	—	—	
	A5 manhole, Lachlan Street.	G.A.	17.5	1.3	—	—	—	—	
	A5 manhole, Lachlan Street.	G.A.	18.3	1.0	—	—	—	—	
	A5 manhole, Lachlan Street.	G.A.	17.3	1.0	—	—	—	—	
12.1.56 ..	A5 manhole, Lachlan Street.	J.D. ²	<16.0	5.0	0.005	N.D. ³	N.I. ³	8	Davy safety lamp extinguished at 8 feet.
			(approximately)	6.2	—	—	—	—	
15.1.56 ..	A5 manhole, Lachlan Street.	G.A.	9.6	7.4	0.002	—	—	12	—
15.1.56 ..	A5 manhole, Lachlan Street.	G.A.	7.6	1.0	—	—	—	17	—
17.1.56 ..	A4 manhole, Lachlan Street.	G.A.	17.2	1.0	—	—	—	23	—
17.1.56 ..	Open hole, East Alma Street.	J.D.	<16.0	<4.0	—	N.D.	N.I.	3	No HCN.
17.1.56 ..	Open hole, West Alma Street.	J.D.	<16.0	5.0	—	N.D.	N.I.	8	—
			(approximately)	4.6	0.001	—	—	—	
	Open hole, West Alma Street.	G.A.	15.4	5.0	—	—	—	7	—
	Open hole, West Alma Street.	J.D.	<16.0	5.0	—	N.D.	N.I.	16	—
			(approximately)	4.6	0.001	—	—	—	
26.1.56 ..	Open hole, West Alma Street.	G.A.	15.4	4.6	0.001	—	—	16	—
26.1.56 ..	Well points, 93 Lachlan Street.	J.D.	4.0	4.0	>1.0	N.D.	P. ³	—	—
26.1.56 ..	Collected at discharge end of a pump operating on an excavation at 93 Lachlan Street.	G.A.	19.9	1.0	0.2	N.D.	N.D.	—	—
Many occasions between February and June.			—	—	—	—	—	From 3 to 20	According to the engineer, whenever a Davy safety lamp was lowered into almost any of the manholes, the flame was extinguished.
6.6.56: 11.15 a.m.	A5 manhole.	H.W. ³	17.6	0.1	Not tested.	Not tested.	Not tested.	20	Davy safety lamp burnt dimly—three weeks since manhole last opened.
11.45 a.m.	D1 manhole, Lachlan and Alma Streets.	H.W.	18.5	0.1	Not tested.	Not tested.	Not tested.	6	Lamp went out; this was probably because it was lowered too quickly. Water at 7 feet below cover: hydraulic test.
12.20 p.m.	A7 manhole, Lachlan and Leonard Streets.	H.W.	17.1	0.5	Not tested.	Not tested.	Not tested.	16	Lamp burned dimly.
12.50 p.m.	Manhole of old system in Lachlan Street towards the river.	H.W.	20.1	0.5	Not tested.	Not tested.	Not tested.	13	Lamp burned normally. This manhole earlier had been full of water.
7.6.56: 9.45 a.m.	F1 manhole, Leonard Street West, 80 yards from Lachlan Street.	H.W.	18.3	0.2	Not tested.	Not tested.	Not tested.	16	Lamp dimmed slightly.
10.10 a.m.	F2 manhole, Leonard Street, west of F1 manhole.	H.W.	18.9	0.1	Not tested.	Not tested.	Not tested.	15	Lamp dimmed slightly.
10.40 a.m.	D3 manhole, Lachlan Street.	H.W.	19.4	0.1	Not tested.	Not tested.	Not tested.	17	Lamp burned normally. This manhole open to D2 under construction.

¹ "G.A."—Government Analyst.

² "J.D."—Chemistry master at the town in question.

³ "H.W."—H. Whalley.

⁴ "N.D."—None detected.

⁵ "N.I."—Below lower limit of inflammability.

⁶ "P."—Probably present in inflammable concentration.

cation of toxic conditions quickly and of course without loss of human life.

2. No person without an approved type of respirator and safety rope tied to him is to be allowed to enter the space until a suitably qualified person, properly protected, has tested it and declared it to be safe.

3. Whether a confined space is considered safe or not it is a very wise precaution that each man working therein should wear a safety harness with rescue rope

TABLE IV.

Month.	Type of Air.	Temperature of Air. (Fahrenheit.)		Composition of Air.	Density of Air.
		Dry Bulb.	Dew Point.		
January ..	Outside.	76°	43°	Normal air, 0.23" H ₂ O.	1.182
	Manhole.	64°	64°	7% O ₂ , 7% CO ₂ , 1% A, 83% N ₂ , 0.60" (=2%) H ₂ O. ¹	1.227
June ..	Outside.	50°	41°	Normal air, 0.26" H ₂ O.	1.243
	Manhole.	64°	64°	7% O ₂ , 7% CO ₂ , 1% A, 83% N ₂ , 0.60" (=2%) H ₂ O. ¹	1.227

¹ 0.60" H₂O represents saturated conditions at 64° F.; this is 2% of the total atmospheric pressure of 30".

attached. A man should be posted continuously outside to observe those inside. He should be capable of recognising symptoms of respiratory poisoning. A second man should be at hand for rescue work if necessary.

4. The atmosphere of every confined space should be considered as dangerous until it has been proved safe, or is freshly blown out by mechanical means, with clean fresh air. It is very logical also to continue the supply of cleansing air while men remain in the confined space.



FIGURE II.

Easily transportable petrol or electrically driven blowers are available (see Figure II, taken from a catalogue issued by the Coppus Engineering Corporation, Worcester, Massachusetts, U.S.A.).

If a flame is extinguished when carefully lowered into the manhole, the amount of fresh air needed is approximately three changes in order to be certain that the oxygen content is 20% or more. Table V shows concentrations in the manhole after varying amounts of air have been

supplied. For the purpose of these calculations, it has been assumed that oxygen was initially entirely absent, and that the incoming air freely mixed with that already in the manhole. In its simplest form, the equation used for the calculations of Table V was as follows:

$$C = C_0 (1 - e^{-N})$$

Where C = oxygen content of manhole air after N air changes

C_0 = oxygen content of normal air (=21%)

e = the exponential 2.71828

Tables of e^{-N} have been published.

TABLE V.

Number of Air Changes.	Percentage of Oxygen in Manhole.
0	0
1	13.3
2	18.2
3	19.9
4	20.6
5	20.9

Conclusion.

Whether or not the air inside a manhole is safe to breathe depends upon a number of factors. Most workers are aware of the possibility of seepage of poisonous gases, but few realize that the oxygen may be quickly reduced to a dangerous level. This is especially apt to occur when the manhole is located in swampy ground. In our opinion the danger of anoxæmia is greatest in hot weather; because of a difference in air density between the inside and outside air, mixing does not necessarily take place when the cover is removed.

Acknowledgements.

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CHRONIC BRONCHITIS—AUSTRALIAN VIEWPOINT.

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IN this country few patients with chronic bronchitis are referred to hospital before severe emphysema has developed. The general practitioner, endlessly exhorted to diagnose all manner of conditions whilst cure is still possible, also carries the burden of early diagnosis in this condition. It is not sufficiently appreciated that whilst chronic bronchitis frequently terminates fatally, early and intensive treatment can at least reduce the rate of progress of the disease in the majority of cases, and may, in some, prevent the development of emphysema. Any therapy applied to patients with chronic bronchitis and advanced emphysema can do little more than to ameliorate symptoms.

From the point of view of early diagnosis, two main groups of patients may be recognized—those with asthma and a cough, and those with a cough only.

Patients with bronchial asthma, of either long or short duration, frequently develop a persistent cough. There seems no doubt that the bronchi of patients with asthma are unduly susceptible to a whole range of irritants. This is presumably the reason why cough, usually with mucoid sputum, is commonly added to wheeze. This condition has been called chronic asthmatic bronchitis. Unless it is brought under control, emphysema will develop, often in association with diffuse pulmonary fibrosis. Bouts of acute infection with purulent sputum may occur. In this context it must be remembered that the presence of large numbers of eosinophils may cause the sputum of asthmatics to appear purulent (Helm *et alii*, 1954) even in the absence of bronchial infection. Treatment aimed at clearing bronchospasm may help the associated bronchitis, even if this is well established. Treatment of infection will usually also relieve bronchospasm.

During the taking of a detailed history from a patient with chronic bronchitis, it is common to find evidence of increased bronchial irritability for many years prior to the development of the established clinical picture. Such people cough readily in response to such minor stimuli as taking a deep breath or laughing. In a smoky atmosphere the future bronchitic patient will be the first of a group of people to start coughing. He is similarly affected on moving from a warm to a cold atmosphere or the reverse. It is not suggested that a definite diagnosis can be reached at this stage, or that stringent treatment should then be instituted; but at least cessation of smoking should be recommended, and any acute respiratory infections should be treated with antibiotics.

After a variable period of time cough becomes more frequent, and what was at first one or two sharp coughs on taking a deep breath is now a paroxysm. On the patient's awakening in the morning, intense discomfort ("tightness") may be noted in the chest. This persists until the chest is "cleared" by coughing, usually with the production of a little clear, viscid sputum, occasionally with vomiting. Colds take a long time to clear and always "go to the chest". Frank infection with purulent sputum is seen in the majority of patients at varying intervals. This is an important point in the evolution of the disease, but unfortunately many patients are unobservant of the colour of their sputum. In the early stages infection is usually brief and intermittent. Later it becomes more frequent and of longer duration. If infection is allowed to persist in a patient with mild chronic bronchitis, the bronchi frequently become sensitized, and the picture of severe bronchitis may thereafter be present.

Wheeze, which is seldom pronounced in this type of bronchitis, is due to tenacious sputum in the bronchi rather than to bronchospasm. Often it may be detected only during acute exacerbations and prior to "clearing" of the chest.

Effort dyspnoea may occur during an episode of acute infection, but in the absence of this and of general medical

causes its constant presence is indicative of emphysema. Emphysema may develop with relatively little or even no preceding bronchitis—so-called "pure emphysema"—but this is a most uncommon condition.

A patient with chronic bronchitis may present with hæmoptysis. This is usually small, amounting to no more than streaking of the sputum with blood, and occurs during acute exacerbations. In such people carcinoma of the lung must be carefully excluded, as this condition is undoubtedly commoner in chronic bronchitis than in others of a similar age and sex distribution. Bronchiectasis may accompany chronic bronchitis. The symptoms of the former are often obscured by those of bronchitis, unless a pathognomonic feature such as profuse hæmoptysis supervenes. Chronic bronchitis is a cause of bronchial dilatation, and gradations between chronic bronchitis and bronchiectasis are commonly seen.

Occasionally, bronchography carried out for unexplained hæmoptysis or on other grounds may reveal evidence of chronic bronchitis. There may be quite well-marked changes, such as bronchial irregularity and dilatation, "banging", sparse branching, peripheral pooling and the formation of diverticula. Such changes may occur in the absence of definite clinical bronchitis, and it is hard to say what attitude should be adopted towards them. However, patients showing these features should be kept under observation, and thorough treatment should be undertaken if and when symptoms of bronchitis appear. It is not possible to draw up an impressive list of differential diagnoses when the full clinical picture of chronic bronchitis is present. Not infrequently a chronic cough is psychogenic (Fitts, 1955), but there are then no infective episodes, wheeze is absent, the chest is not "cleared" and rhonchi are absent.

Bronchitis may occur in association with many conditions, and care must be taken not to overlook mitral stenosis, carcinoma of the lung, tuberculosis and bronchiectasis in patients presenting with chronic bronchitis. The dust which is responsible for pneumoconiosis may also render a patient bronchitic.

The principles governing the treatment of chronic bronchitis are straightforward, and no special facilities are required. The majority of sufferers are cigarette smokers. It must be pointed out to them that they are deliberately insulting their bronchial mucosa with a most powerful irritant. Withdrawal of tobacco must be complete and permanent. Frequently this measure alone will suffice to abolish cough.

When a patient is overweight, reduction should be advised. Similarly anaemia should be sought for and corrected if present.

Possibly the most neglected aspect of the treatment of chronic bronchitis is the control of bronchial infection. There is no doubt from the work of Reid (1954) that infective exacerbations are associated with progressive lung destruction and consequent emphysema. Whenever the sputum is purulent on macroscopic examination, infection should be presumed to be present. Whilst the sputum may be examined bacteriologically, this will not be of great assistance unless special research facilities exist (Douglas *et alii*, 1957).

When infection is intermittent and infrequent, a short course of an antibiotic should be given promptly at the commencement of each attack. Infection which has been allowed to persist is more difficult to clear. If an orally administered antibiotic is chosen, the intelligent patient may be given a supply of the drug and requested to start taking this as soon as the first symptoms of an acute infection are noticed.

If infection is constantly present, or when it occurs very frequently, antibiotics should be given on a long-term basis, if necessary over a period of years. In certain cases it may be possible to discontinue treatment during the summer months. Penicillin will clear more than 50% of acute episodes of infection (Douglas *et alii*, 1957). In general practice it may be given as procaine penicillin, in a dosage of 600,000 units twice a day by intramuscular injection. Should this prove successful, orally administered penicillin

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V, 125 to 250 milligrammes five times daily, may be tried for subsequent attacks. If penicillin is successful on one occasion, it will usually succeed subsequently. Knox *et alii* (1955) have claimed fair results for aerosol penicillin in these circumstances. Certainly high concentrations of the drug can be attained in the sputum by this method.

In the event of penicillin failing to control infection, tetracycline (three grammes) or chloramphenicol (two grammes) daily in four divided doses should be given for one week. The latter drug is the more consistently successful (Douglas *et alii*, 1957), but the reported risk of bone-marrow changes is considered by some physicians to outweigh its advantages. If chloramphenicol is used, courses should not be repeated more frequently than once each three months.

Tetracycline is the drug of choice for long-term administration. It should be commenced in a dosage of three grammes per day. When the sputum is rendered mucoid, the dosage can be gradually reduced to one gramme or even three quarters of a gramme per day.

Orally administered penicillin V in the dosage mentioned above will succeed in a proportion of cases, and has the merits of relative cheapness and even greater freedom from side effects.

The treatment outlined above will usually result in marked symptomatic improvement in chronic bronchitis, but there are a few simple measures which may also be of value. A patient who has to "clear" his chest each morning often finds that a drink of really hot water or tea renders him more comfortable and makes raising of the sputum easier. The use of iodides does not seem helpful in this respect. Ineffectual nocturnal cough which keeps a patient awake is best controlled by a linctus containing codein (30 to 60 milligrammes) or "Physeptone" (2.5 to 5.0 milligrammes). This may be repeated once if necessary. During acute exacerbations, it is advantageous to keep the patient in a room at an even temperature. This probably explains why so many patients improve rapidly soon after their admission to hospital. "Alevaire" is probably of no more than psychological benefit.

The contamination of inspired air by irritant matter is an important factor in causing and aggravating chronic bronchitis, and the elimination of this matter from the patient's environment is highly desirable in treatment. Many industries expose workers to high concentrations of dust. This is seen not only in coal mining, but also in engineering works, flour mills, *etc.* Whilst certain dusty industries have specific diseases associated with inhalation of contaminated air, chronic bronchitis is aggravated by almost all forms of dust. Such a dust hazard can frequently be minimized by the use of exhaust ventilation, which, however, often involves considerable expenditure. Where this cannot be economically carried out, the wearing of masks is helpful, although it is difficult to enforce their use by workers. Patients with chronic bronchitis exposed to dust in industry (or to sudden temperature changes) may benefit from a change in occupation, although this can seldom be accomplished without considerable financial sacrifice.

One of the most notable causative factors in chronic bronchitis in Britain is atmospheric pollution. The pollutants are largely by-products of the combustion of black coal, and millions of tons are poured into the atmosphere there each year. The problem is gradually being tackled by the use of smokeless fuel, and by the declaration that in certain zones, rapidly increasing in number, only smokeless fuel can be burned. Such a programme is extremely costly, as fires and furnaces must be converted to the use of smokeless fuel, and the fuel itself is expensive.

Australia differs from Britain in having much less heavy industry. Further, this is distributed over a greater area with a lower density of population. Another factor is that Australia is deficient in coal and it is available to few homes as a source of heating. With the rapidly developing industrialization of this country, atmospheric pollution may yet become an important problem. A close watch should therefore be kept upon the degree of pollution in the major cities, and steps taken to control it before dangerous levels are reached.

In general, the Australian climate is favourable as regards bronchitis, although some of the more southerly regions are sufficiently cold and damp at certain times of the year to be responsible for seasonal exacerbations. There is no doubt that bronchial infection is commoner in cold weather. Further, at such times a patient may be worse symptomatically even in the absence of infection. Fogs are especially troublesome in this regard, although they are rarely comparable in severity here with those seen in Britain. At the comparatively low level of atmospheric pollution at present obtaining in Australia, it is unlikely that "smog" could be seen. This, of course, is especially dangerous to sufferers from chronic bronchitis.

With its natural advantages of climate and space, it would be disastrous if, in Australia, chronic bronchitis was permitted to become even more common than it is at present. A planned programme of decentralization of industry and encouragement of the use of smokeless fuel will pay rich dividends in public health.

Acknowledgements.

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Reports of Cases.

PRIMARY CARCINOMA OF THE RECTUM DIAGNOSED DURING PREGNANCY.

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PRIMARY CARCINOMA of the rectum complicating pregnancy is a rare occurrence. McLean *et alii* (1955), of Detroit, have quoted an incidence of one in 50,000 cases.

Clinical Record.

Mrs. A., aged thirty-six years, was first examined on May 14, 1955, in the twenty-eighth week of her fourth pregnancy, complaining of diarrhoea which had persisted for one week. During the previous three months she had been very constipated despite taking all types of aperients. She had constant low backache. Investigation of her past history revealed that she had undergone an appendicectomy during the tenth week of her present pregnancy. Her previous obstetric history was normal.

Examination of the patient revealed her to be a tired looking woman with dark circles around her eyes. The blood pressure was 130/80 millimetres of mercury, and the urine was normal. Examination of the abdomen revealed a large reducible incisional hernia containing intestine originating from a lower right paramedian operation scar. The size of the uterus corresponded to the period of amenorrhoea. A single fetus presented by the vertex, and the foetal heart sounds were heard. Nothing abnormal was detected on vaginal examination. Rectal examination revealed an annular constriction 10 centimetres above the anus. The lumen of the constriction was sufficient to admit entry of one finger. The patient was referred to a surgeon, who confirmed the diagnosis of carcinoma of the rectum.

He thought that the neoplasm was localized to the rectum, and that the chances of survival for the patient would be better if an abdomino-perineal operation could be performed early after confinement. Ten days later she was admitted to hospital for surgical induction of labour. Examination revealed that the blood pressure was 135/90 millimetres of mercury, and the urine was normal. The abdomen was moderately distended. The uterus was the size of thirty weeks' gestation. The fetus presented by the breech, and the fetal heart sounds were heard. An external cephalic version was attempted, but found impossible, owing to the incisional hernia and abdominal distension. An *enema saponis* produced flatus and a semi-fluid result. Puncture of the hindwaters was performed with a Drew-Smythe cannula, and clear liquor amnii was obtained. The intravenous drip administration of "Pitocin" was commenced shortly afterwards. One hour after the induction, vaginal haemorrhage began, and the patient became shocked. Abdominal palpation at this time was very difficult owing to considerable abdominal distension and the hernia. The intravenous administration of "Pitocin" was discontinued, blood transfusion was commenced and pelvic examination was carried out under light "Pentothal" anaesthesia. No abnormality was detected in the vagina. The cervix was dilated to admit two fingers, and the breech was lying in the pelvic cavity. The placental edge could not be felt in the lower uterine segment. Accidental haemorrhage was diagnosed. A foot was pulled down through the cervix and a one-pound weight attached in order to stimulate uterine retraction. The rectum was ballooned below the cancerous stricture, which felt almost completely stenosed. After the examination haemorrhage ceased, and labour continued for three hours. At the end of this time a stillborn female child weighing three pounds four ounces has delivered. The placenta was complete and appeared normal. After delivery of the placenta there was a brisk post-partum haemorrhage, which was controlled by the intravenous administration of ergometrine. After delivery a prophylactic course of penicillin and streptomycin was commenced in order to minimize risks from genital and extragenital sepsis, and the intravenous administration of fluids was continued for twenty-four hours. Abdominal distension started to subside soon after delivery, and the patient passed flatus voluntarily. On the second day a high calorie, low-residue diet was started. By the eighth day of the puerperium a marked improvement was observed in the patient's general condition. She was ambulant, and able to take food and to pass fluid faeces. The haemoglobin value was 10.8 grammes per centum. On the tenth day a mild intermittent rise in temperature developed, and this continued for five days. *Bacillus coli communis* was grown in culture from cervical swabs. On the thirteenth day vaginal examination revealed that the cervix admitted a finger-tip, that the uterus was anteverted and the size of a twelve weeks' gestation, and that there was some induration in both fornices. Rectal examination revealed a patent annular constriction of the upper part of the rectum.

Three weeks later abdomino-perineal resection was performed. At operation it was found that the neoplasm, the appearance of which was typical of adenocarcinoma, had widely infiltrated the bowel wall, and had surrounded three-quarters of the circumference of the rectum over a length of three inches. The lower border of the tumour was 10 centimetres above the anus. There were metastases to the pararectal and sigmoid glands, but the liver was not affected. The segment of bowel removed consisted of rectum, sigmoid colon and colon up to the splenic flexure. Diseased lymph nodes were removed. A transverse colostomy was performed.

The patient was discharged from hospital six weeks after operation. Death occurred three months later from distant metastases.

Comment.

The diagnosis of carcinoma of the rectum is often difficult in ordinary patients in the cancer age, owing to the insidious onset of the condition, and to the paucity of symptoms until the tumour has reached a fairly extensive size. It is understandable, therefore, that the condition is likely to be missed in young pregnant patients owing to its rarity, and to the ability of early carcinoma symptoms to mimic the normal symptoms of pregnancy, such as persistent constipation, abdominal distension, backache, nausea and vomiting. Yet the careful observer may detect the difference which calls for further investigation by visual and digital anal examination, rectal examination, sigmoidoscopic examination and biopsy of accessible tumours. Diagnostic X-ray studies of the intestinal tract should be made

if necessary. Cruveilhier, of Paris, was the first to report a case of this rare disease in 1842. Since then 66 other cases have been described (McLean, 1955).

The management of coexisting carcinoma of the rectum and pregnancy has closely reflected evolutionary changes in the fields of surgery and obstetrics during the past century. In the years 1878 and 1879 respectively—shortly after Porro suggested combined Caesarean section and supravaginal hysterectomy (Spivak, 1941)—Hicks and Kaltenbach (1879) first reported the performance of Caesarean sections on pregnant patients with cancer of the rectum. In 1891, shortly after Kraske (Katz and Kaspar, 1926) had perfected his technique of transsacral resection of the rectum, Heineke (Holzapfel, 1899) was the first to attempt this operation on a patient who was six months pregnant. Later, in 1899, Hochenegg and other surgeons followed suit, and gradually modified the original Kraske operation to the modern abdomino-perineal resection (Katz and Kaspar, 1926).

A review of 66 cases reported in the world literature indicates that there are certain principles governing treatment (McLean, 1955). The management is determined by the stage of pregnancy, by the extent of the malignant disease, and by the presence or absence of complications. If diagnosis is made prior to the twentieth week of gestation, there is a tendency to treat the neoplasm without disturbing the pregnancy, which is allowed to continue. If diagnosis is made between the twentieth and twenty-seventh weeks, patients are treated according to the extent of the malignant disease early, curable lesions are dealt with by hysterotomy and resection without delay, and advanced lesions by Caesarean section at or after the thirtieth week, followed by palliative treatment for the malignant disease. If diagnosis is made in the third trimester, Caesarean section or vaginal delivery followed by resection of the tumour after an interval of two weeks is the general rule. Should an emergency occur, such as perforation, severe haemorrhage, ulceration or obstruction, the case is dealt with without regard for the pregnancy.

Analysis of cases reported in the literature shows that carcinoma of the rectum is more successfully treated in the first two trimesters of pregnancy. Review of patients treated after the twenty-eighth week indicates that the post-partum mortality rate of 33% increases with the period of gestation, irrespective of methods of delivery. Fetal wastage varies from 13% to 50% among patients treated respectively by Caesarean section and vaginal delivery.

In the case under consideration in this paper, prompt post-partum abdomino-perineal resection appeared to be the treatment of choice. In view of the high operative mortality rate from resection alone, and of the patient's multiparity, a vaginal delivery was preferable to delivery by Caesarean section. Combined Caesarean hysterectomy and abdomino-perineal resection in one stage was considered inadvisable owing to the patient's debilitated condition. It seemed feasible that delivery of a three-pound fetus would not cause trauma to the tumour. A review of 20 similar cases reported in the literature (McLean, 1955) revealed that eight out of nine mothers survived vaginal delivery, whereas eight out of eleven mothers survived delivery by Caesarean section. In this case Caesarean section in the interest of the fetus was not indicated, because the chances of survival of a thirty-week premature baby were precarious irrespective of the manner of delivery. As it happened, normal delivery became abnormal with breech presentation and accidental haemorrhage. The mother survived, but the baby was stillborn. Subacute large-bowel obstruction caused by the neoplasm resulted in abdominal distension and aggravation of a preexisting incisional hernia. This prevented external cephalic version. The increased intraabdominal pressure possibly predisposed the patient to accidental haemorrhage, which was precipitated by the sudden drop in intrauterine pressure caused by the surgical induction of labour. The puerperium was uneventful, except for mild pelvic cellulitis. Labour intensified the preexisting subacute bowel obstruction. Possibly direct pressure from the fetus during delivery caused oedema of the neoplastic tissues, accounting for this.

Summary and Conclusions.

1. Adenocarcinoma of the rectum diagnosed at twenty-eight weeks of gestation is reported.
2. Difficulties in diagnosis of neoplasm of the rectum in pregnancy are mentioned.

3. Treatment of malignant disease of the rectum associated with pregnancy is reviewed.

4. The importance of careful investigation of constipation in pregnancy is emphasized.

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Reviews.

Practical Otolaryngology. By Gervais Ward McAuliffe, M.D., F.A.C.S., F.I.C.S.; 1957. New York: Landsberger Medical Books, Incorporated, distributed by The Blakiston Division of the McGraw-Hill Book Company. 8" x 5½", pp. 320, with 12 plates. Price: \$7.00.

THE author of this book is Associate Professor of Otolaryngology at Cornell University, but he has succeeded in avoiding the academic approach. In fact, he states in the preface: "This book is written for the general practitioner. It is in no sense a text-book." The practical aspects are well presented and clearly illustrated by line drawings or apposite case histories. A knowledge of anatomy is fundamental, the author believes, and he spares no effort to correlate it with clinical features. This makes the book rather long, but there is a commensurate gain in clarity. Cough is discussed in detail, as well as the most common ear, nose and throat conditions in everyday practice. A chapter is devoted to the author's "Wet Suction Treatment of the Tonsil", a method seldom seen elsewhere. For Australian readers, the section on *otitis externa* is inadequate, but a section on frostbite should establish the reason for this. A short chapter is devoted to "Maxims in Otolaryngology", most of which make good sense; however, one or two would not find universal approval—for example: "Purulent otitis media can be produced by excessive manipulation of the ear canal." Finally, the chapter on "Emergencies in Otolaryngology" leaves no doubt about what to do and how and when to do it.

The use of the head mirror is emphasized both in this and in two similar books reviewed in recent years. With it and a book of this type the general practitioner should find his touch more sure in the management of many of the ear, nose and throat diseases which form such a large part of general practice.

Health for Effective Living: A Basic Health Education Test for College Students. By Edward E. Johns, Ed.D., F.A.P.H.A., Wilfred C. Sutton, Ed.D., Lloyd E. Webster, M.A., adviser and consultant, and Walter H. Brown, M.D., with a foreword by Bernice Moss, Ed.D.; 1954. New York: McGraw-Hill Book Company, Incorporated. 9" x 6½", pp. 492, with 59 illustrations. Price: \$4.75.

THIS is a most comprehensive and informative work, nicely printed on a good paper and set out in such a way as to make for easy reading. The subject matter is well supported by a number of tables and diagrams, and the work is well illustrated. These factors all contribute to making it valuable to the students for whom it is designed.

The authors explain that the scope of the book is broad, and that it is written as a guide for students and instructors studying together the basic factors producing good health. A perusal of the various chapters leaves no doubt in one's mind that this claim is well fulfilled.

The six parts with their 18 chapters cover a very wide field and offer an extraordinary amount of information in an easily assimilable form. The advice as to orientation and the development of a healthy personality provides an excel-

lent introduction to what follows in regard to effective family living and the maintenance of health.

Too much scientific detail and too many technical terms, which can make such a book overwhelming for students generally, have been avoided, and yet sufficient facts are presented to establish a solid foundation for the more comprehensive fields which are explored later.

The advice on sex education is excellent and most practical, and the data on nutrition and infectious diseases, and the information on health matters in relation to college, community and nation are very valuable indeed. The whole problem of health is well rounded off in the last chapter on world health problems, for at the present time, with increased facilities for international communications, most matters have now to be viewed from global aspect.

This book is to be highly recommended to students and lecturers alike, irrespective of what calling they will eventually follow.

The Essentials of Materia Medica, Pharmacology and Therapeutics. By R. H. Micks, M.D. (Dublin), F.R.C.P.I.; Seventh Edition; 1957. 8" x 5½", pp. 442. Price: 28s.

ANY text-book of *materia medica* is doomed to become seriously outdated in less than five years, and this new edition of "Micks" has appeared after an interval of only three years. In spite of this, more than 30 new drugs have been included.

It is laudable that, in spite of its greater coverage, there has been a slight reduction in the size of the book, owing to the extensive rewriting of the text which the author has undertaken.

A new chapter has been added dealing with anticonvulsant drugs and the control of epileptic conditions, and several chapters have been extended, particularly that dealing with electrolyte and water balance. Cardiac drugs and the treatment of heart disease are discussed in two chapters in a very clear and practical manner.

The coverage of this new edition is very complete and comprises 33 chapters. It is difficult to find any important omissions; the newer antibiotics, drugs for oral treatment of diabetes and the most accepted tranquilizers are also included, and the author shows praiseworthy conservatism in evaluating the status of the latest "achievements" in pharmacology.

This book has been improved very considerably in the present edition. It ranks as a useful book for the general practitioner, who will find it a valuable guide through the maze of new pharmaceuticals, which grows daily more complicated.

Principles of Urology: An Introductory Textbook to the Diseases of the Urogenital Tract. By Meredith F. Campbell, M.S., M.D., F.A.C.S.; 1957. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical), Limited. 10" x 6½", pp. 646, with 319 figures. Price: 95s.

PROFESSOR MEREDITH CAMPBELL is already well known for his classical productions on clinical paediatric urology (1951) and urology (1954), and any further work from him must receive great attention.

This volume is truly an introduction of the student to the broad fundamentals of urology, based upon long experience, research and a scholarly mind; but it is doubtful whether it achieves its other object of "serving as a practical guide for the physician who is not a urologic specialist". There is insufficient detail in diagnosis and treatment for this purpose.

The arrangement of the 14 chapters is such that each surveys one aspect of the urinary tract—embryology and anomalies, infections, injuries, the male reproductive tract, neuro-muscular uropathy, tumours and calculous disease.

As might be expected, the section on embryology and anomalies of the uro-genital tract is outstanding, and fills 90 pages out of the total text of 566 pages. The author is emphatic that treatment of cryptorchism should begin immediately after the third birthday, and that operation should not be delayed if a short course of hormone therapy fails.

Four pages are taken to describe the technique of rectal examination. It could be read with profit by resident medical officer and specialist alike, and the author's three rules absorbed—to be "gentle, gentle, gentle". One must also agree with his assertion that the greatest fundamental error in urological investigation is the examination of casually collected urine specimens, particularly in the female, in

whom a catheter must be used. One does not, however, agree with the method of strapping a catheter in place in the male, the prepuce having first been retracted behind the glans and an encircling band of adhesive plaster applied in that situation. Oedema must often ensue, and paraphimosis in inexperienced hands.

Like most urologists, the author does not favour the lower abdominal compression bag or the use of the Trendelenburg position in excretion urography. His only contraindications to this procedure are hypersensitivity to the urographic medium (often minimized by antihistamine drugs), and a poor renal function which will not give sufficient urographic shadows. In reeducation of the bladder, he emphasizes the efficacy of triple micturition and uses drugs of the choline series freely.

The author's outstanding experience is recalled time after time throughout the text, and there is very little to which exception can be taken. As a basic foundation to urology this book is ideal and fills a gap not covered by the usual smaller urological text-book. It should be read by all candidates for a higher surgical diploma, to whom not the least of its attractions will be the questions detailed for each chapter at the end of the book.

Aids to Diagnosis and Treatment of Diseases of Children. By F. M. B. Allen, M.D., F.R.C.P. (Lond.); Tenth Edition; 1957. London: Baillière, Tindall and Cox. 6½" x 4", pp. 314. Price: 10s. 6d.

This is a helpful little book for the student to use as a refresher before examinations. It is well set out and explicit, containing a short description of most paediatric conditions with their treatment. The appendix with a list of diets, drug dosages and prescriptions is instructive. The student would not go amiss to have a copy of this as a revision handbook.

X-Ray Technology. By Charles A. Jacobi, B.Sc., R.T. (A.R.X.T.), M.T. (A.S.C.P.), M.T. (A.M.T.), and Donald E. Hagen, R.T. (A.R.X.T.), with a foreword by James M. Hilton, M.D.; 1957. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical), Limited. 9½" x 6½", pp. 412, with 320 illustrations. Price: £5 7s. 3d.

THERE have been an increasing number of text-books for technicians (radiographers) in the past few years. All these books have been striving to condense the training of the technician in the complex study of X-ray units, physics, chemistry and radiography in specialized books on each subject or in one volume combining them all. The book under review attempts to combine all subjects, and since it is not a very large volume, some of the sections must be short and inadequate. Radiology and radiographic technique cover so many specialized fields that this volume could only provide the basic training for general radiography.

Composition of matter, electricity and X-ray circuits are all dealt with in 34 pages including diagrams, and the section on X-ray physics covers 17 pages, with diagrams. These chapters do not reach the standard or the scope of the lectures given to Australian radiographers in the course run by the Australian Institute of Radiography. The chapter on preventive maintenance (three pages) is of little use. X-ray equipment is so complex these days that maintenance must be carried out by specialized X-ray engineers. The small section on ethics does not give credit to the technician for much common sense or education. The sections on bones, anatomical physiology and anatomy are well illustrated and sufficiently descriptive, and should be easily understood. The section on positioning and radiographic technique is comprehensive, and a reasonable amount of space with fundamental description is given to all the specialized examinations.

"Thorotrast" is included in the list of contrast media (page 346), but it should be noted that it was given up by many people some years ago because of the possibility of a carcinogenic tendency, and its manufacturers print on the packet the following caution: "Warning! For use only in cases of extreme emergency or where life expectation is relatively short." Most of the illustrations in positioning are taken from Merrill's text-book (1949), Volumes 1 and 2.

The sections on electrocardiography and basal metabolic rate estimation are too short to be of much use. The glossary is well set out and comprehensive and should be useful; but many of the words included would be more suitable for medical students. Some terms, such as "K.U.B.", are not explained, and are not used to any extent in Australia.

This text-book is useful, but tries to cover too much ground in the present volume. If used as the only text-book for the Australian course, it would not be sufficient.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Australia in the War of 1939-1945": Series 3, Air, Volume 2: "Air War Against Japan, 1943-1945", by George Odgers; 1957. Canberra: Australian War Memorial. Sydney: Angus and Robertson, Limited. 9½" x 6", pp. 548, with illustrations. Price: 25s.

Describes both the operations and the general problems of the Royal Australian Air Force in the war against Japan from 1943 to the end of the war.

"The Fluoridation of Public Water Supplies: Report of the Commission of Inquiry", presented to the House of Representatives by Command of His Excellency; 1957. Wellington: R. E. Owen, Government Printer. 9½" x 6½", pp. 240. No price stated.

The report of a commission appointed by the New Zealand Government.

"The Proximal End of the Femur: Investigations with Special Reference to the Etiology of Femoral Neck Fractures: Anatomical Studies, Roentgen Projections, Theoretical Stress Calculations, Experimental Production of Fractures", by Stig Backman; 1957. Stockholm: Acta Radiologica Supplement 146. 9½" x 7½", pp. 170, with 70 illustrations. Price: Sw. Kr. 35.

The title is self-explanatory.

"Demographic Studies on Carcinoma of the Uterine Cervix in Sweden", by O. G. A. Berggren; Part I; 1957. Stockholm: Acta Radiologica Supplement 145. 9½" x 7½", pp. 148. Price: 30 Sw. Kr.

The title is self-explanatory.

"Experimental Studies on the Disappearance of Radiosodium Ions from Local Deposits in the Cavity and in the Wall of the Vagina of the Rat", by Björn Westin; 1957. Stockholm: Acta Radiologica Supplement 144. 9½" x 7½", pp. 88, with 42 illustrations. Price: Sw. Kr. 30.

A study in the absorptive capacity of the vaginal wall under various conditions.

"Bronchiectasis: Radiological Diagnosis and Prognosis After Operative Treatment", by Carl Einer Gudbjerg; 1957. Stockholm: Acta Radiologica Supplement 143. 9½" x 7½", pp. 118, with 45 illustrations. Price: Sw. Kr. 25.

The results of investigations at the Department of Radiology, University Hospital, Copenhagen.

"Quantitative Roentgenologic Studies on Changes in Mineral Content of Bone in Vivo", by Karl-Ake Omnell; 1957. Stockholm: Acta Radiologica Supplement 148. 9½" x 7½", pp. 88, with illustrations. Price: Sw. Kr. 25.

The title is self-explanatory.

"Systemic Reticuloendothelial Granuloma", by Per Wetling, Kurt Sundberg and Gunnar Söderberg; 1957. Stockholm: Acta Radiologica Supplement 149. 9½" x 7½", pp. 68, with 32 illustrations. Price: Sw. Kr. 25.

The authors present their experiences in clinical, radiological and histological diagnosis as well as the radio-therapeutic effects in the management of this condition.

"The Secret of Serenity", by Gordon Powell; 1957. London: Hodder and Stoughton. 7½" x 5", pp. 128. Price: 7s. 6d. (English).

The advice of an experienced Christian minister for those faced with the problem of tension.

"General Principles Governing the Use of Food Additives", World Health Organization Technical Report Series No. 129; 1957. Geneva: World Health Organization. Price: 1s. 9d.

The first report of the Joint FAO/WHO Expert Committee on Food Additives.

The Medical Journal of Australia

SATURDAY, NOVEMBER 30, 1957.

THE PUBLICATION OF CONGRESS PAPERS AND PROCEEDINGS.

ARRANGEMENTS are already well in hand for the scientific meetings of the Tenth Session of the Australasian Medical Congress (British Medical Association) to be held in Hobart from March 1 to 7, 1958. Many interesting contributions have been promised. However, at recent past sessions of Congress some confusion seems to have existed in the minds of contributors and would-be contributors of papers, at times to the detriment of the scientific programme, and it is important that the position should be made clear.

The arrangements are in fact quite straightforward. All papers read at Congress and the text of remarks introducing a discussion become the property of the Federal Council, which is the ultimate governing body of Congress, and are not to be published without the sanction of the Executive Committee. A summary of each paper is included in the report of the proceedings of Congress, which is published as promptly as possible in the Journal. All papers are normally submitted to the Editor of the Journal for consideration, but it will be appreciated that publication of every paper in full is neither practicable nor desirable. Nor is it possible, because of the large number of papers involved, to reach an immediate decision about them all. However, with the cooperation of authors it should be possible to put the matter on a basis satisfactory to everyone.

The attitudes and wishes of contributors of Congress papers vary widely, and it is not always easy for us to divine what they are. One will prepare a paper, perhaps by request, as a basis for discussion and have no wish that it should be published in full. Another will put much thought and original work into a paper that he is anxious to have published as soon as possible. Yet another will prepare a specialized paper that he quite rightly judges more suitable for publication in a specialized journal than in THE MEDICAL JOURNAL OF AUSTRALIA; perhaps he will hesitate to present it to Congress at all, wishing to retain freedom of publication. These are the main situations, but none of them should offer real difficulty. If it is requested, a decision can be made shortly after Congress about the publication or otherwise of a paper in the Journal, and a sympathetic hearing will be given to any suggestion that a paper be released for publication elsewhere, although it remains our policy to encourage the publication of significant Australian work in Australia rather than overseas. It will be appreciated if authors will advise us of their wishes, either directly or

through the Congress executive, when they submit the copies of their papers as required by the rules of Congress. If no such advice is received, it may be assumed that the authors have no particular wish for their papers to be published, and a decision in this regard may be deferred indefinitely.

For the purposes of the Congress proceedings, each author is asked to submit with his paper a suitable summary, which is published with an account of the discussion. The procedure for the reporting of discussions will be the same as at the Sydney Congress in 1955. A representative of the Journal will attend all scientific meetings, and the chairman of each meeting will be asked to advise those present who the representative is. Those taking part in discussions who wish their remarks to be reported will be asked to hand an account of their remarks (preferably condensed) to the Journal's representative, who will collate the individual contributions, but will not be responsible for taking notes of the discussion. This puts the onus on the individual speaker, but gives him the real advantage that he is unlikely to be misreported if he presents satisfactory notes in legible handwriting.

No member of Congress can attend more than a very limited number of meetings; so the satisfactory reporting of the proceedings is of great importance both to those who attend Congress and to those who do not. Cooperation from all who take part will help us to make the proceedings as good as is reasonably possible.

SURVEY OF RUBELLA PREGNANCIES.

Most practitioners are now familiar with the survey of rubella pregnancies organized by the Department of Obstetrics and Gynaecology in the University of Melbourne, together with the Royal Women's Hospital. The chief aim of this research is to establish the risk or rate of malformation in the baby when the mother has suffered from German measles in early pregnancy. In the early Australian work it was claimed that the risk was high—something over 70%. The validity of this conclusion has been challenged, both overseas and, more recently, in Australia. As overseas work has suggested that the risk is something under 20%, this new work has been undertaken in order to arrive at the truth.

One result of the early Australian claim was that, for many years, termination of pregnancy became practically a routine recommendation to the mothers who had the misfortune to suffer rubella in the first trimester. When more conservative overseas figures became available, a move against this policy became evident in Victoria; how far this reaction has progressed is shown in an interim report issued by the Department of Obstetrics and Gynaecology in the University of Melbourne, which lists 51 cases of rubella in pregnancies (to June 30, 1957), of which only three have been terminated. Thus in private practice it appears that termination of pregnancy has ceased to be standard practice. The material has been drawn from patients of members of the British Medical Association, and it seems unlikely that any bias could arise through the possibility that doctors who believed in termination did not report their cases. The mechanics of the survey

preclude this bias; it will be remembered that it is insisted that cases be reported to the Department on the day on which the rash is diagnosed—and therefore before termination could have been suggested. Thus it is probably a valid conclusion that termination of pregnancy in this situation is, in this part of the world, now little practised.

The requirement of early reporting of cases also ensures that no bias towards abnormal infants can occur, as all cases enter the series long before the result of the pregnancy is known. The final answer, therefore, should be statistically impeccable. Early reporting also ensures the maximum accuracy of the diagnosis of rubella, with the obtaining where possible of a second opinion, and the examination of a blood film.

We would therefore urge all those practising obstetrics to cooperate in this survey by observing the following procedure: (i) When rubella is diagnosed in a pregnant woman, the Department should be informed as rapidly as possible, by telephone or telegram. (Telephone arrangements: day, FJ 0484, extension 253; night, BL 7392, Dr. David Pitt.) This is the key step in the survey. (ii) A second opinion should be obtained if possible on the rash. (iii) A punch card for clinical details and slides for blood films, which will be sent back immediately to the referring doctor, should be completed and returned to the Department.

Current Comment.

RÖNTGEN SHADOW AND ULTRASONIC ECHO IN CARDIOLOGY.

IMPROVEMENTS in X-ray technique have made this procedure a necessity in the examination of the human heart. E. Zdansky, the director of the University Institute for X-ray diagnosis and for radiotherapy in Basel, has recently published a readable article on the Röntgen picture of the normal heart.¹ There is nothing exactly original in this review, but the facts are clearly presented with the aid of simple but effective line diagrams. The heart of the baby occupies a larger share of the thorax than in later life; the right ventricle is large, and the pulmonary artery is wide, relics of foetal circulation. One regular feature is the wide range of alteration in size which it can display; thus in crying there is a Valsalva condition blocking venous return to the thorax and causing a marked diminution in size of the heart as a whole. Zdansky makes it clear that the large thymus and its subsequent diminution must never be forgotten. In the adolescent one finds the adult condition established. During the child's growth the heart not only changes in dimension *pari passu* with the body, but undergoes certain alterations in form. Accumulation of fat in the abdomen can, as we all know, push the heart cranially. In adult life a lability of form and size is dependent on thoracic packing and the elasticity of the aorta. High blood pressure is often accompanied by a surprisingly small change in cardiac outline. Zdansky states that in those men who work hard and eat and drink freely and are emotionally uninhibited a dilatation of the left ventricle is noticeable, whereas in those whose lives are placid normalcy will be found. He does not state whether this placidity is caused, in part at least, by the physical condition. Some pathological conditions are mentioned briefly, but the main theme of the article is the Röntgen picture of the heart in health, in both sexes, during growth and in senility.

¹ *Deutsche med. Wchnschr.*, July 19, 1957.

In ultrasonic vibrations, as the name implies, the frequency is higher than the human ear can detect—that is, above 20,000 per second. The reflection of such vibrations has been put to many uses in metallurgical and engineering science and has in English-speaking countries been employed in the diagnosis of tumours, especially mammary tumours. That ultrasonic echoes can be of use in the investigation of heart conditions has been put forward by three Dusseldorf researchers, S. Effert, H. Erkems and F. Grosse-Brockhoff.¹ A full description is given of the apparatus necessary. Bursts of ultrasonic vibrations are directed 200 times a second into the skin over the heart, and the reflected waves are caught by a quartz crystal and transformed into electric currents which can be measured and recorded. The authors ascribe to ultrasonic echoes some advantages over X-ray pictures, for these latter give only peripheral contours of the heart, whereas the reflected waves arise in the endocardium of the ventricles and atria and yield information concerning the interior of the organ. Pericardial effusion is also readily demonstrated by this method. The authors candidly admit that as air is practically opaque to ultrasonic waves, only those portions of the heart not covered by lung tissue can be explored. The method is only in its infancy, and further improvements and amplifications are awaited.

NATURAL IMMUNIZATION AGAINST POLIOMYELITIS.

THE widespread use of artificial stimulation of active immunity against poliomyelitis, which has occurred since the development of the Salk vaccine, has created an abrupt alteration in the significance to be attached to vital statistics of the disease. In the U.S.A. the disease has been notifiable since 1916, and the occurrence of epidemics of greater or less severity has caused large peaks upon the graphs of yearly mortality rates. R. L. Vought and Morris Greenberg² have taken the figures up to 1954 and analysed them by the method of cohort mortality, which follows the rate of a given group through successive time periods. The results of these curves show the rising age incidence of the disease, indicating that the effectiveness of natural immunization has decreased and that the age of the susceptible population has increased. The decrease of the paralytic case morbidity, which closely follows the fall in mortality, is steady, and the expected mortality of children born in the next quinquennium is expected to fall still further. Realization of these facts is very necessary in the anticipation of the results of artificial immunization. The degree and quality of hygiene, in relation to infants and school children, as well as the processes of natural immunization, have already begun to show results. The great contribution of the artificial immunization campaign should lead to the abolition of the paralytic form of the disease. The prevention of the natural process of immunization is far from desirable; indeed, its contribution to the present favourable state of affairs is definitely to be remembered.

SMALLPOX AND INTERNATIONAL TRAVELLERS.

No less than 18 countries were infected with smallpox by international travellers last year, and as a result eight of them suffered epidemics of this quarantinable disease, according to the World Health Organization Committee on International Quarantine, which met recently in Geneva. The Committee warned against any relaxation of vaccination measures against smallpox and called for the use of potent vaccines as well as correct vaccination procedures. Moreover, it stressed the need for medical and other personnel who come in contact with travellers to maintain a high level of immunity against smallpox by repeated

¹ *Deutsche med. Wchnschr.*, August 2, 1957.

² *J.A.M.A.*, 1957, 164: 1050 (July 6).

vaccination. In the course of these epidemics, some doctors treating tourists caught the infection and died. The eight countries where smallpox epidemics took place were Ceylon, Ghana, Iran, Italy, Lebanon, Sierra Leone, Sudan and the United Kingdom. The countries where smallpox was imported without spreading to the population were Argentina, Federal Republic of Germany, Greece, India, Iraq, Jordan, Netherlands, Paraguay, Syria and Uruguay.

The Committee has also drawn attention to the advantages of dried smallpox vaccine for mass campaigns. It is pointed out that dried vaccine is easily transportable, remains effective without refrigeration and does not spoil, even in the tropics.

GEOGRAPHICAL PATHOLOGY OF CANCER IN UNDEVELOPED COUNTRIES.

MANY CANCERS are not distributed uniformly throughout the countries or peoples of the world. Recently much work has been done on the incidence of cancer with the aim of isolating causative or precipitating factors. Classical examples of cancers with a marked geographical incidence are the *kangri* cancers of the abdomen, chimney-sweeper's cancer of the scrotum, the skin cancer of white races in tropical and subtropical areas, the lung cancers of Schneeberg and Joachimsthal and cancer of the bladder associated with schistosomiasis. This list could be greatly extended by consulting P. Steiner,¹ J. Clemmesen² and H. F. Dorn.³ Thus, J. N. P. Davies and B. A. Wilson⁴ carried out a survey of the clinical records of the larger native hospitals and of the European and Asian hospitals of Uganda. They have compared their figures with the well-known London survey of W. L. Harnett.⁵ About 15% of the male and 7% of the female cancers in the Uganda series were cancers of the skin, as against 9% and 6% respectively in the London series. However, in the Uganda series, there were 25 Kaposi sarcomata and eight melanomata in a total of 54 skin cancers, showing that there is quite a difference between the types of skin cancer in London and Africa. The British Empire Cancer Campaign is assisting in the establishment of a registry at Kampala. J. Higginson⁶ has reported a study on the Bantu in Johannesburg, showing a high incidence of skin cancer and Kaposi sarcoma. In both Harnett's and Higginson's studies it also appears that primary cancer of the liver is a very common cancer. In the London series only some 0.2% of cancers were primary in the liver, but in Uganda males primary cancer of the liver constituted some 9% of all cancers. C. Berman⁷ has given a description of the disease, especially as it affects the Bantu, and cites an autopsy series of his own in which over 90% of all cancers were primary in the liver. J. B. Cleland⁸ found three cases of primary cancer of the liver in a series of 12 cases of cancer in Australian aborigines. Berman's map of incidence shows a high incidence of primary liver cancer in equatorial Africa, South Africa, India, Eastern Asia and part of the East Indies. It is now believed that this cancer occurs in areas in association with malnutrition and cirrhosis of the liver. Since *kwaschior* has recently been identified in New Guinea, there are interesting possibilities of research there. T. C. Backhouse⁹ has reported six primary cancers of the liver in a series of 82 cases of malignant disease, and J. J.

Saave,¹ also working in Rabaul, has reported six in a series of 80. It seems that Australia, with the responsibility for the medical care of over one million inhabitants in New Guinea, can help to extend knowledge of such geographical factors in the aetiology of cancer by further more intensive studies of pathology and epidemiology.

SMALLPOX AND ALASTRIM.

IN A report on the use of the chick embryo to distinguish between the viruses of *variola major* and *variola minor*, David Helbert² discusses the difficulty in clinical diagnosis between the two forms, and points out that the different results of infection in vaccinated and unvaccinated people has obscured some of the possibilities. Since the increase of technical tools available to the virus worker has expanded the approach to the problem, various attempts have been made to seek a clear-cut difference between the strains of virus isolated from clinical *variola major* and clinical *variola minor*. Inoculation of material from crusts of skin lesions readily infects the chorio-allantoic membrane, and the appearance of the pocks is similar in each. Neutralization tests in eggs using serum from patients and virus suspensions are difficult to perform, and antibody may not be at a detectable level until crusting of the lesion has begun. Helbert had available a series of virus strains isolated from three small outbreaks in England during the last ten years and one strain from a case of *variola minor* in the Sudan. He compared samples of each by the appearance of pocks on the chorio-allantoic membrane, he titrated the amount of virus present in the chick liver, and he compared the mortality rate of embryos in egg inoculated with identical doses of virus. The graphs of the amount of virus show a steady increase in both strains, but two logs difference between them on the third and fourth day of the experiment; while the mortality amongst eggs inoculated with strains from alastrim was consistently lower over a range of three doses of virus, and never reached the 100% kill of the *variola major* strains. The value of the chick embryo in identification of the difference between these two strains of virus seems to be clear cut.

A NEW JOURNAL OF SURGERY FOR CANADA.

THE Canadian Medical Association has shown commendable enterprise and wisdom in starting the *Canadian Journal of Surgery*. In a foreword to the first number, Robert M. James, Chairman of the Editorial Board of the new journal, states that, amongst other reasons, technical and financial problems have prevented Canadian surgeons from realizing their dream of a journal of surgery in their own country. The Canadian Medical Association has solved this problem by making available the services of its editorial staff and by assuming the immediate problems of finance. It is now up to the surgeons of Canada to make the journal a success.

The first number of the *Canadian Journal of Surgery*, dated October, 1957, augurs well for the future and is a credit to the Editorial Board and to the Editor, Dr. S. S. B. Gilder, under whose editorial guidance *The Canadian Medical Association Journal* has reached a high standard. We commend the new journal to Australian surgeons as a significant contribution to surgical writing and wish its promoters success in their venture. The subscription rate (the journal is published quarterly) is \$10 per year. Communications should be marked "Canadian Journal of Surgery" and be addressed to the Editor, C.M.A. Publications, C.M.A. House, 150 St. George Street, Toronto 5, Canada.

¹ "Cancer: Race and Geography", 1954, Williams & Wilkins, Baltimore.

² Editor, "Symposium on Geographical Pathology and Demography of Cancer", 1950, Council for the Coordination of International Congresses of Medical Sciences.

³ "Ecological Factors in Morbidity and Mortality from Cancer", in "Trends and Differentials in Mortality", 1956, Milbank Memorial Fund, New York.

⁴ *East African M. J.*, 1954, 31: 395.

⁵ "A Survey of Cancer in London", 1952, British Cancer Campaign, London.

⁶ *South African M. J.*, 1953, 27: 341.

⁷ "Primary Cancer of the Liver", 1951, Lewis, London.

⁸ *J. Trop. Med. & Hyg.*, 1923, 31: 157.

⁹ *M. J. AUSTRALIA*, 1955, 2: 1061.

¹ *M. J. AUSTRALIA*, 1956, 2: 682.

² *Lancet*, 1957, 1: 1012 (May 18).

Abstracts from Medical Literature.

DERMATOLOGY.

The Skin's Reactions to Life's Stresses.

C. S. WRIGHT (*Arch. Dermat.*, June, 1957) states that stress factors are commonly present in psychogenic pruritus, which may be generalized or more commonly localized to erotic areas such as the vulva, perineum or anus. In neurodermatitis and atopic eczema, stresses are only one component in the total of aetiological factors. *Alopecia areata* at times seems related to stress. Anxiety is known to cause hyperidrosis, predisposing to *tinea pedis* or a clinically similar condition of the hands, both of which may render a man unfit for work involving contact with potential skin irritants. Dysidrosis and pompholyx may be associated with stress. In cases of urticaria, particularly the chronic variety, stress seems to be the initial trigger mechanism. The gastro-intestinal disturbances that are believed at times to play an important role in rosacea may be partly dependent on stress factors. There are numerous other dermatoses in which stress factors are believed to play at least a partial role in causing or continuing the disease, such as *lichen planus*, psoriasis, *acne vulgaris* and *lupus simplex*. When a stress factor may be present, the importance of history taking cannot be over-emphasized, and sufficient time must be allotted for this at the initial visit to clarify the aetiology and make the patient realize that the physician is taking a deep interest in his case. While an attempt is made to overcome the patient's anxieties, sedatives and tranquilizers may be helpful, but their limitations must be understood.

Skin Eruptions Caused or Aggravated by Sunlight.

O. C. STEGMAIER (*Illinois M.J.*, August, 1956) classifies skin eruptions caused by sunlight as follows: (i) Sunburn. Sunburn sequelae less familiarly known are (a) *herpes simplex*, (b) folliculitis, (c) vitiligo, (d) chloasma, (e) increased sensitivity to further light exposure. (ii) Farmers' and sailors' skin. (iii) Skin cancer. (iv) *Hydroa aestivale*, usually appearing in childhood, the condition occurring each year in spring and summer. (v) *Xeroderma pigmentosum*, a familial disease characterized by lack of inherent protection against sunlight. (vi) Polymorphic light eruptions, which manifest themselves in four types: (a) plaque-like; (b) contact-eczematous type, which resembles *dermatitis venenata*; (c) papular and prurigo type; (d) erythematous type (*erythema solaris persans*). (vii) Solar urticaria. (viii) Photosensitization due to drugs ingested; for example, sulphoamides, barbiturates and thiazine, when taken internally, sensitize the skin to ordinary sunlight exposure. (ix) Photosensitization due to chemicals and plants applied to the skin followed by sunlight exposure; most important are coal-tar derivative chemicals and certain plants: (a) oil of bergamot contained in perfume

and eau-de-Cologne; (b) coal tar and pitch, which may produce keratosis and skin cancers; (c) some derivatives of para-aminobenzoic acid; (d) plants—parsnips, marrow, meadow grass, gas plant, common rue, Persian lime and figs. Dermatoses aggravated by sunlight are as follows: (i) *Lupus erythematosus*, both the chronic discoid and systemic forms. (ii) Pellagra. (iii) Porphyrin—erythropoietic porphyria, which begins in early childhood, and hepatic porphyria, of which the following forms are listed: (a) acute intermittent porphyria, (b) *porphyria cutanea tarda*, (c) mixed types—a combination of (a) and (b), and (d) latent porphyria. (iv) Bacterial skin infections, such as infectious eczematoid dermatitis and seborrhoeic dermatitis. (v) Vitiligo and albinism. (vi) *Pityriasis rubra pilaris* and *keratosis follicularis*.

Recent Advances in Dermatological Therapy.

G. M. LEWIS AND D. TORRE (*Am. J.M.Sc.*, May, 1957) state that in the field of syphilis significant advances have been made in both diagnosis and treatment. Diagnostic visualization of the spirochete has been made easier by the use of a stain utilizing Parker 51 blue-black ink. More widespread availability of the *Treponema pallidum* immobilization test has enabled the dermatologist more readily to determine biological false-positive serological reactors. In patients suspected of having late manifestations, such as cardiovascular syphilis or *tabes dorsalis*, for which the usual serological tests are inconclusive, the T.P.I. test will frequently help to establish the diagnosis. The City of New York Department of Health currently advocates the following schedules using procaine penicillin G in oil with 2% aluminium monostearate given intramuscularly: (i) Primary, secondary and early latent syphilis or syphilis in pregnancy: 6,000,000 units—2,400,000 units first dose, then 1,200,000 units for three injections at two- to four-day intervals. (ii) Late latent, cardio-vascular, gummatous and osseous syphilis: 6,000,000 units in five equal doses at two- to four-day intervals. (iii) Neurosyphilis: 12,000,000 units in 10 equal doses at two- to four-day intervals. (iv) Congenital syphilis: early (less than two years)—10 doses each of 150,000 to 300,000 units (adjusted to the weight of the child) at one- or two-day intervals; late—same dosage as in comparable manifestations of acquired syphilis, with dosage adjusted to weight in young child. In skin tuberculosis, the use of isonicotinic acid derivatives has revolutionized treatment. Isoniazid in oral doses of three to eight milligrammes per kilogram of body weight has become the treatment of choice for *lupus vulgaris*, supplanting caliciferol and other older remedies. Other true forms of skin tuberculosis such as scrofuloderma, *tuberculosis colligativa*, *tuberculosis verrucosa cutis*, *tuberculosis fungosa* and *erythema induratum* respond to this simple treatment. Side effects and toxicity are minimal. So-called tuberculids do not respond. In vitiligo, since 1952 psoraline derivatives have been given an extensive trial. Severe local reactions and questionable toxic effects on the liver have been

reported. The disadvantages also include usually incomplete repigmentation, recurrence when treatment is stopped, and hyperpigmentation of normal skin areas. The *lupus erythematosus* cell and phenomenon are now recognized as specific, and their demonstration constitutes a most important advance in exact diagnosis of the systemic disorder. In treatment of discoid *lupus erythematosus*, and to a lesser degree of the systemic form the antimalarial drugs have become the drugs of choice. "Atebrin", 100 milligrammes once or twice daily, or chloroquine, 250 milligrammes once or more daily, is given in courses, one drug often being alternated with the other. In fungal infections the necessity of avoiding sensitizing drugs in the treatment of inflammatory manifestations in which *Trichophyton mentagrophytes* has been isolated is stressed. In contrast, patients with *T. rubrum* infections tolerate drugs with impunity. "Asterol" in tincture or ointment, unsaturated fatty acids (undecylinic and propionic) in ointment and powder and "Nystatin" (in moniliasis) are additions to therapy of superficial mycoses which seem destined to remain. In systemic blastomycosis, some headway has been made with the administration of stilbamide. Referring to tranquillizing drugs, the authors state that chlorpromazine, which is effective in psychoses, is of limited usefulness in psychosomatic dermatoses. The rauwolfia compounds are free of the side effects of jaundice, agranulocytosis and photosensitivity occasionally accompanying chlorpromazine therapy, but have the disadvantage of a latent period of up to two weeks, during which the patient not only experiences no relief, but frequently feels worse. Meprobamate ("Equanil" or "Miltown") seems more suitable for dermatological practice. The drug has no latent period and relatively low toxicity; occasional side effects are drowsiness, gastric discomfort, urticaria, erythematous rashes, fever, fainting spells, angioneurotic oedema and bronchial spasm. It is the authors' belief that steroids administered systemically are contraindicated in the treatment of psoriasis and for most eczematous eruptions. Their use is well established in the treatment of pemphigus, systemic *lupus erythematosus* and self-limited allergic eruptions.

Acute Porphyrinuria and Coproporphyrinuria following Chloroquine Therapy.

M. J. DAVIS AND D. E. VAN DER PLOEG (*Arch. Dermat.*, July, 1957) report in detail two cases of acute porphyria and coproporphyrinuria following chloroquine therapy. They state that in recent years chloroquine has been found effective in the treatment of chronic discoid *lupus erythematosus* and light-sensitive eruptions. The dosage of chloroquine commonly used in the treatment of chronic discoid *lupus erythematosus* and light-sensitive dermatoses has ranged from less than 0.1 to more than 0.5 gramme per day. The percentage of side reactions is greater when higher dosages of the drug are used. In the two cases reported, toxic reactions developed shortly after chloroquine therapy. In one case chloroquine caused

abdominal symptoms, hepatic dysfunction and increased urinary excretion of uroporphyrins, coproporphyrins and porphobilinogen, and in the other case abdominal symptoms and increased excretion of coproporphyrins. These changes were apparently reversible after the drug was discontinued.

Fatal Agammaglobulinæmic Progressive Vaccinia.

H. M. LEWIS AND F. C. JOHNSON (*Arch. Dermat.*, July, 1957) report a case of fatal agammaglobulinæmic progressive vaccinia, and give a classification of human cutaneous vaccinia. After successful vaccination, three different types of antivaccinal antibodies are normally demonstrable. The production of at least one of these, the virus-neutralizing antibody, is dependent on adequate endogenous supplies of gamma globulin. In the absence of gamma globulin, virus neutralizing antibody is not formed. Consequently the initial site of vaccination undergoes progressive enlargement and necrosis. The many new concomitant lesions which result from hæmatogenous virus dissemination undergo a similar metamorphosis and show no sign of healing. Ultimately, despite administration of vaccinia-immune globulin, the host is destroyed by the vaccinia virus.

Porphyria Cutanea Tarda.

I. D. LONDON (*Arch. Dermat.*, July, 1957) reports a case of porphyria cutanea tarda successfully treated with chloroquine. In this case the use of chloroquine cleared bullæ, sunlight sensitivity and porphyria. The patient has been followed for one year since the start of therapy, and has remained free of skin lesions for eight months with intermittent therapy and for two months with no therapy. Laboratory findings indicate that uroporphyrin has disappeared from the urine after this treatment. At the beginning one chloroquine tablet (0.25 gramme) was taken twice daily, and after seven weeks the dose was reduced to one tablet per day for three months; the patient then took one tablet every other day and occasionally omitted the medication for a week for about another month. Then treatment was stopped, and no new lesions developed.

UROLOGY.

Cystectomy for Vesical Exstrophy.

H. M. SPENCE (*J. Urol.*, March, 1957) states that recent efforts to close the exstrophic bladder and construct a sphincter mechanism in order to avoid the shortcomings of uretero-colic anastomosis are commendable. However, until such techniques are improved and their superiority has been proved by long-term results, he thinks that current treatment should continue along the lines of bilateral uretero-colic anastomosis, cystectomy and correction of the associated genital defects. He presents a simplified technique for the cystectomy and for repair of the abdominal wall defect after the ureters have been successfully transplanted. Only the mucosa of the exposed bladder is removed; the muscular wall is left intact and is utilized

for closure of the abdominal wall defect. Generally, this is best done about six to eight weeks after the ureteric transplantation. After removal of the mucosa from above downwards in one large sheet, including pulling out and removal of the ureteric stumps, the denuded muscular wall is inverted by progressive rows of chromicized catgut sutures, which unfold the tissues transversely and serve to plug the defect between the diverging lower rectus muscles.

Renal Artery Aneurysm.

E. F. POUTASSE (*J. Urol.*, May, 1957) states that renal artery aneurysms are probably more common than autopsy or clinical reports have hitherto indicated. Since 1952 the author has observed 12 patients with various types of renal artery aneurysm. Seven had saccular aneurysms, three had post-stenotic or jet aneurysms in association with hypertension, one had an epistiform aneurysm in association with a hypernephroma, and one had a large arterio-venous aneurysm. Aortography is a valuable means of establishing the diagnosis of aneurysm and of differentiating calcified arterial plaques within the wall of the renal artery. Aortography has also proved of value in the demonstration of unusual non-calcified types of renal artery aneurysm in hypertensive patients. Excision of the aneurysm and repair of the renal artery were performed in two of the cases of congenital saccular aneurysm; post-operatively normal renal function was demonstrated in each. It is mentioned that large, symptomatic aneurysms, especially in hypertensive patients, should be treated by excision or nephrectomy, whether they are calcified or not. Small, asymptomatic, calcified aneurysms in non-hypertensive patients probably can be followed up without surgical operation.

Chemotherapy in Prostatic Cancer.

R. H. KLÜNDE AND H. WILMANN (*Brit. J. Urol.*, March, 1957) state that the treatment of prostatic carcinoma by contrasexual hormone is based on the fact that androgens stimulate such a cancer, while oestrogens inhibit it. In giving oestrogens it is assumed that the secretion of androgens is inhibited either directly or via the anterior pituitary lobe. Testicular atrophy (or ablation) is followed by increased secretion of gonadotrophins and by compensatory enlargement of the adrenal cortex. In the later stages of hormonal treatment, therefore, increased androgen from the adrenal stimulates the growth of the carcinoma again. In recent years numerous clinical investigations have been carried out on the organo-specific therapy of prostatic carcinoma with stilbæstrol diphosphate. This is a phosphorylated form, readily soluble in water, and can therefore be injected intravenously. The acid phosphatase in the carcinomatous tissue selectively splits off the phosphate groups from the stilbæstrol diphosphate supplied intravenously. The senior author himself has reported on results of this treatment in 36 cases. Subjective improvement is apparent much sooner than with hormone treatment, most particularly in the rapidity with which pain disappears in patients with bony metastases. Bedridden patients, dependent on opiates, frequently

become pain-free and ambulant again after only a few injections. The drug's effect on the primary tumour is evident in the investigation of symptoms associated with micturition. Endoscopic resection, however, is frequently necessary when a large obstructive tumour is present. The effect of stilbæstrol diphosphate on metastases during treatment can be checked by assessing the acid and alkaline serum phosphatase. Success of treatment can be judged from a return of the acid phosphatase to normal. It has been confirmed generally that many cases that have become refractory to oestrogens may still respond to intensive therapy with phosphorylated stilbæstrol. On account of the great convenience of taking simple stilbæstrol by mouth, the best routine is to use the hormone under clinical and biochemical control; on obtaining evidence of relapse one should switch to phosphorylated stilbæstrol. Three cases are added, in each of which treatment (and control) have been used for about three years, and the progress of the disease kept at bay by daily intravenous injections of stilbæstrol diphosphate.

Cutaneous Ureterostomy.

K. O. OBRANT (*Brit. J. Urol.*, June, 1957) has described a method of establishing a cutaneous ureterostomy which allows one to disperse with the use of an indwelling catheter to carry the urine away and to keep the stoma open. Other surgeons have made use of a skin tube or papilla to this end, and the author's suggestion is a modification of the same idea. An oblique hypogastric incision is used, the ureter being found extra-peritoneally and divided as low down as possible. The duct is drawn out to at least four centimetres beyond skin level. A skin flap, shaped like a triangle with its apex truncated, is fashioned on each side of the incision, and these flaps are later sutured together in such a way as loosely to embrace the protuberant ureter. The flaps must therefore be 3.5 centimetres long; this also allows them to fit the collecting apparatus, a light transparent plastic cup. The skin flaps are of full thickness, and in thin patients the subcutaneous fat down to the deep fascia is included. The ureter must project 0.5 to 1.0 centimetre beyond the skin tube. The tip of the skin tube must be covered with everted ureteric mucosa to avoid stenosis. A catheter, which has been in the ureter during this plastic procedure, is left there until the collecting plastic cup is applied. Two weeks after the operation, when all sutures have been removed, a plaster cast is made of the ureteric papilla and surrounding skin area. From this cast the plastic cup is made. The cup has a central tube which fits firmly over the skin papilla almost up to its tip. If later shrinkage of the skin papilla allows leakage of urine between the papilla and the central tube of the cup, a fresh cast is taken, and a new plastic cup is made from this model. The cup is kept firmly in position by an elastic band. Most of the patients thus treated by this author had only one kidney left after an earlier nephrectomy; but when two kidneys are present, cutaneous ureterostomy on one side only is possible by performing uretero-ureteral anastomosis.

Brush Up Your Medicine.

GLAUCOMA: ITS MODERN CONCEPT.

EVER since ophthalmology acquired the detailed knowledge it now possesses, glaucoma has been the object of special investigation. New weapons of research have driven it back, and its strongholds seemed to be falling one by one when, fairly quickly, its retreat assumed the appearance of a strategic withdrawal. Now that its origins are more clearly recognized, they appear deeply rooted in basic vascular habits, and so far as treating the condition is concerned, medicine for the time being may well have to be content with a Pyrrhic victory.

Until less than a decade past, glaucoma spelt the destruction of the eye simply through raised intraocular pressure. Sometimes this presented itself in the form of an acute attack, when blindness was sudden in onset and was preceded by pain and prostration. At other times it was unobtrusive, and the field of vision was slowly whittled down in a seemingly normal eye till a tiny area of sight was preserved round the fixation point; then eventually this flame flickered into darkness. In the latter case the eye was held to be intolerant even of average pressures. A profusion of symptoms and signs were collected: haloes round lights, raised intraocular tension, cupping of the disk, enlargement of the blind spot, scotomata and loss of peripheral field. It was recognized that glaucoma showed a tendency toward familial occurrence and to be precipitated by worry, and once it had become established in one eye, it was seen almost invariably to occur sooner or later in the other one. Although it is a disease characteristically of later life, it was found in infancy, and the large eye of buphthalmos was correctly ascribed to it.

The first step in coming to grips with the condition was to lay down those facts about it which seemed sufficiently proven to deserve the name of rules. These were able to be listed as follows:

1. High intraocular tension was the essence of the disease.
2. High intraocular tension could be relieved surgically by a broad iridectomy in those cases in which the condition was acute and the anterior chamber was shallow, or by a filtering operation, such as a trephine or iridencleisis, when the condition was less acute and the anterior chamber was normal.
3. The use of pilocarpine and eserine drops contracted the pupil and so freed the filtration angle, assisting in the escape of aqueous into the canal of Schlemm.
4. Cupping was due to the nerve head giving way in the face of raised intraocular tension.
5. Scotomata and field loss were due to the death of retinal elements, directly as a result of pressure itself or from ischaemia due to it.

Such assumptions at least placed glaucoma on a treatable footing, and given an early diagnosis and a dextrous surgeon, it appeared that the condition could be controlled.

Great emphasis was laid on the geography of the eye. The hypermetropic eye was usually short in its antero-posterior diameter, and as it harboured a lens of normal size, it followed that the root of the iris was pushed forwards and the filtration angle was narrowed. The invention of the gonioscope made it possible to examine this region in detail, and gonioscopy was regarded as the means of demonstrating that raised intraocular tension was due to blocking of the filtration angle.

Then, little by little, anomalies became recognized, which at first were explained as exceptions until their repeated occurrence threatened to disturb the accepted concept of the disease. For example, cupping was seen to occur in eyes with normal tension. Furthermore, it was found to be absent in many cases in which the eye, for example from iridocyclitis, had endured a high tension for many months. The gonioscope revealed that in cases of glaucoma the filtration angle was not necessarily blocked, and eyes successfully operated upon to relieve high tension proceeded quietly on their path to blindness as irrevocably as if they had never been touched.

These discoveries required an overall explanation which, though it might contain loopholes, could nevertheless cover the situation in broad outline, and further anatomical and physiological research has produced one which is very attractive. To present it, and to suggest that glaucoma is a condition much more inherent in the organism than is implied by a failure of the drainage mechanism to accommodate the rate of production of intraocular fluid, is the object of this paper.

The two mechanisms which are responsible for maintaining the intraocular tension are the one which produces the intraocular fluid and the other which allows it to escape from the eye. By intraocular fluid or aqueous is meant the watery content of the eye which is elaborated at the blood aqueous barrier (the capillary walls of the whole of the inside of the eye), to which is added a secretion produced from the ciliary body. Perhaps it would be as well to remark here that the vitreous does not enter into consideration, and to define it as a body composed of a network of fibrillar micellae enmeshing a viscous jelly of hyaluronic acid, the whole of which is permeated by the intraocular fluid. Vitreous lost at operation is never replaced, and its volume is made up only by the intraocular fluid.

The most important single group of factors influencing the production of the intraocular tension is formed by the hydrostatic head of pressure in the capillaries and the protein osmotic pressure of the blood, which act in reverse directions. The higher the former may be, the greater is the rate of diffusion of intraocular fluid into the eye, to which the protein osmotic pressure of the blood, as a result of its colloid content, acts in some measure as a counterbalance. In iritis, however, there is a colloid content of the aqueous, and the osmotic pressure due to this acts with the hydrostatic pressure in the capillaries, enhancing its effect and diminishing that of the protein osmotic pressure of the blood.

The item of pre-eminent importance so far as the production of intraocular fluid is concerned is the state of the capillary pressure. This is not necessarily related to the general blood pressure, and a high systemic load held by the peripheral resistance of the arterioles may exist in the face of a low capillary load. A break through this barrier in a state of hyperpietic crisis will flood the local circulation of the eye, and, of course, dispose it to glaucoma because of the increased capillary content.

Substances such as eserine and pilocarpine dilate the capillary bed and even open up new capillary districts, while having little influence on the arterioles. They therefore facilitate the flow of available blood through the capillaries and lower the hydrostatic head of pressure there. Atropine, on the other hand, dilates the arterioles and has little effect on the capillaries. Consequently it increases the hydrostatic head of pressure in the capillaries, leading to a greater production of intraocular fluid and so to a rise in tension of the eye.

A most important fact is the state of the venous outflow, and provided this is unimpaired, considerable uveal dilatation may be compatible with normal intraocular tension. Blocking of the venous outflow by, for example, a carotico-cavernous aneurysm, may considerably embarrass the *status quo*, when smaller irregularities of the intraocular circulation, otherwise well tolerated, may produce a rise in intraocular tension. Generally speaking, it is the resultant effectivity of the combined factors of the general blood pressure, the integrity and state of the arterioles, the state of the capillaries as regards both their calibre and the permeability of their walls, and the venous pressure which determines the tension of the eye.

From the preceding remarks, it will be seen that eserine and pilocarpine have a beneficial effect on intraocular tension by dilating the capillary bed, opening up new capillary districts and facilitating the flow of blood through the capillary channels, so lowering the hydrostatic head of pressure in them; and that this useful action is over and above their more popularly acclaimed one—namely, that they contract the pupil so that the filtration angle is opened up and the drainage of aqueous into the canal of Schlemm is improved.

The relative merits of these two actions may be better understood if the mode of exit of the aqueous from the anterior chamber is considered. Very briefly, the aqueous passes through the trabeculae into the canal of Schlemm, whence it is collected into aqueous veins which pierce the sclera and enter the anterior ciliary veins where the aqueous meets the venous blood. A residual pathway is inherited from the lower mammals, providing in somewhat altered form drainage into the ciliary plexus via efferent veins, which penetrate the sclera parallel to the aqueous veins and end similarly in the anterior ciliary veins. This route is nothing, like so efficient as the one through the canal of Schlemm, but under certain abnormal circumstances it is effective in some degree. Considerable importance, therefore, belongs to the pressure gradient down the exit pathways, and a raised venous pressure from any cause has proved to be a far more important factor in causing a rise in intraocular tension than actual anatomical blockage of the pathway itself. In fact, such a blockage is moderately rare, and gonioscopy has shown that the drainage angle may be open during an attack of acute congestive glaucoma. This discovery is, of course, startling, and in the language of the Press, is "news" indeed.

Having commented upon the site of origin of the intraocular fluid, and discussed in some degree its mode of exit, we may now mention certain facts established experimentally, and collate these with the observed symptoms and signs of glaucoma. In so doing we may produce the hypothesis which seems most likely to unlock its secrets. This, then, is an attempt to bridge the gap between the laboratory and the clinician. Though the nature of progress is to reduce this gap, only in completed acts of research, of course, can it be abolished, and the problem of glaucoma falls far short of this distinction.

It has been known for some time that there is a regular daily variation of the tension of the normal eye, averaging from one to two millimetres of mercury (Schiotz); the tension usually rises to 8 a.m. and falls through the remainder of the day. Experimental evidence has made it likely that the underlying cause of this is a rhythmic alteration in the capillary pressure of the eye. The vascular events during this variation are seen to be as follows. The pressure, both systolic and diastolic, in the anterior ciliary arteries remains constant, but the venous pressure shows changes comparable with those of the intraocular pressure, and it is observed that these venous changes precede the alteration in tension of the eye. As the venous pressure is readily reflected in the pressure in the capillary circulation, it seems unlikely that this variation in the venous pressure is itself primary, and presumably it depends on events in the capillary bed.

In primary simple glaucoma, the intraocular base pressure of the eye may remain normal, but the variations run riot, and it is as if in this state of wide oscillations the eye has lost some power of vascular control. At first and for a long period the tension is able to return to normal, but it eventually remains high and the base pressure rises also. When such a state of irreversibility has been reached, one might expect some similar irreversible state to have developed in the capillaries. Indeed, in such eyes as have come to examination, widespread sclerosis of the capillaries is seen.

The suggestion is that while the sclerosis is confined to the posterior segment of the eye, the intraocular tension is not greatly disturbed. When the areas of sclerosis are considerable enough to affect the overlying retina, its nervous elements perish, with the production of scotomata. The nerve fibres degenerate centripetally to the optic disk. The optic nerve shows areas of disappearance of nerve fibres without compensating increase in glial substance, so that empty lacunae are formed and cupping occurs. Similar lacunae or caverns may occur far up the nerve where raised intraocular tension could not account for them, and the picture is one commonly seen in any highly differentiated organ when the blood supply is cut off. Cupping is primarily due to this process, though, of course, a raised intraocular tension will increase it. A similar picture is seen in lacunar atrophy of the brain, when the cerebral cortex degenerates in the same way in the condition of senile vascular sclerosis.

As the sclerosis comes to involve the anterior structures of the eye, the filtration angle and the aqueous veins may be involved and the drainage mechanism embarrassed. So the intraocular tension rises and may reach great heights—far greater, in fact, than in the acute attacks of congestive glaucoma in which haloes round lights are such a prominent symptom. In the high tension of primary simple glaucoma, haloes do not occur, showing that the tension of this condition and that due to acute congestive glaucoma are the result of different causes.

In primary congestive glaucoma, in which cupping is notably absent except in the later stages, the essential lesion is capillary stasis with increased permeability leading to oedema of the tissues of the eye (raised intraocular tension and haloes round lights). Compare this with the primary simple type already described, in which congestion and oedema are absent, the process being one of slow sclerosis. Here, as a reminder, cupping is present early. In the congestive type a series of subacute episodes takes place, from which the eye recovers, and during which lights are seen surrounded by a flare. Usually a final attack leads to a state of congestion which becomes irreversible and strangulating, and unless prompt treatment is implemented, sight will be lost. It is in this condition when miotics fail, as they very often do, that the old operation of broad iridectomy, or the more modern one of peripheral iridectomy, is so successful for a useful period of time, and this is the type of attack which is occasionally seen clinically to be precipitated by emotional strain. If structurally these eyes have a shallow anterior chamber, the attacks of congestion may force the root of the iris forwards and tend to close the filtration angle. Consequently, synechiae or adhesions may

form here, but—and again this is news—these synechiae are the result of glaucoma and not the cause of it.

In a short paper it is, of course, impossible to give a carefully constructed description of the disease; but from the foregoing remarks its origin may be traced to the behaviour of the capillary bed, and it seems that a rise of intraocular tension is a secondary state controlled primarily by vascular influences. High tension, when it occurs, needs treatment, usually surgery; but too much overall success must not be hoped for even if the operation has been perfectly carried out. Certainly, if the vascular theory of glaucoma is accepted, some explanation is available to account for its displaying a familial tendency, and also for its liability to be precipitated by worry, and, once it is established in one eye, eventually to become bilateral. Furthermore, the exceptions mentioned early, which failed to fit in with the old theory that the symptoms and signs of glaucoma are ascribable solely to high intraocular tension, now find a more plausible explanation.

KEITH ARMSTRONG.

Sydney.

British Medical Association.

NEW SOUTH WALES BRANCH NEWS.

FOCLA Annual Post-Graduate Week.

THE Federation of Country Local Associations held its sixth post-graduate course in Maitland from September 16 to 20, 1957.

The course was officially opened by the Honourable D. A. Cameron, Federal Minister for Health. The chairman was Dr. Peter Gill, of Singleton, the President of the Hunter Valley Medical Association (deputizing for Dr. J. Gribben, President of the Federation of Country Local Associations).

The Memorial Oration was delivered by Dr. F. P. M. Solling, of Maitland, on "James Joseph Hollywood and His Time". Dr. Solling now holds the Orator's Plate for the ensuing year.

A total of 47 doctors attended at various times, excluding the lecturers and including 20 from Maitland.

The Organizing Committee wishes to express appreciation of the assistance given by the Federation of Country Local Associations Executive. The committee also wishes to bring to the notice of the Executive the interest displayed by Dr. G. L. Howe, President of the New South Wales Branch of the British Medical Association. Dr. Howe visited Maitland for the official opening and returned again with his wife for the latter part of the course. The committee's thanks are also expressed to the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, to Dr. Hugh Hunter, to Dr. V. M. Coppelton, to the College of General Practitioners; and to Burroughs Wellcome & Co. and the Evans Medical Company for donations towards our expenses.

The presentation of the course meant a lot of work, but gave the organizers a great deal of pleasure, and the committee feels that every effort should be made to continue with these annual post-graduate weeks.

Correspondence.

INTERVERTEBRAL DISK DISEASE.

SIR: I would like to draw the attention of all medical practitioners to the first publication of "Documenta Rheumatologica Geigy". This has been compiled for Geigy by a board of experts and so can be regarded as a valuable contribution. The contents give the most clear description of the whole subject with exceedingly good illustrations. Any medical practitioner can study this without feeling it is too technical for him, and should have a copy on hand to help in diagnosis with the excellent dermatome and muscle diagrams provided. With its help, he can much more easily work out the mechanism of production of pain which could lead to a more accurate diagnosis and so a more definite and purposeful course of treatment.

As a criticism there are one or two points. Firstly, the clarity of description may make the less experienced believe that all pain in the low back or lower limb is due to disk disturbance; also that most arm pains are due to the same

pathology. Many papers have been written about these subjects, and those experienced enough know that disk disturbance is very real in all spinal regions, but there are many other conditions which will simulate, have a different pathology and need entirely different treatment.

Secondly a criticism must be made about treatment. I must agree with the statement: "Had all the milder cases of sciatica and lumbago due to disk lesions been included the number of spontaneous cures would undoubtedly have been greater." In my experience, most severe sciaticas (more than the 25% quoted) will respond, if given a reasonable amount of time, to a trial of rational conservative treatment. The last paragraph of page 52 is one that should be carefully considered by all who have to take charge of these cases: "Experience gained during the past few years, together with the statistical evaluation of operative results, has not shown surgical treatment to be absolutely satisfactory. Rather has it demonstrated that the indication to operation must be more closely restricted and that there is no simple 'either-or' in the treatment of this disease. We regard conservative therapy and surgical treatment as equally indispensable. With few exceptions a logical conservative treatment appropriate to the nature of the case should always precede operation."

As regards conservative therapy, it is essential to treat according to diagnosis and not just because of fashion. Backache is not so commonly rheumatic, unless there are other manifestations of the disease. The value of "Novocain" in therapy and as a diagnostic procedure is very helpful. Manipulation plays an important part in treatment, but it must be done only by the experienced, who know the dangers and make a correct diagnosis. Seldom do you manipulate an acute disk, but often you cure a subluxation of a sacro-iliac joint, and often you free a painful back due to fixation by adhesions.

The section on cervical disk pathology is remarkably well done, but the inexperienced may become confused about cases presenting for diagnosis. Particularly is this so when there is a stiffness or limitation of movement of the shoulder joint. This is commonly due to a lesion of the shoulder joint and not necessarily the cervical spine. That there is disk degeneration or pathology as seen by X ray is quite coincidental. X rays taken of the cervical spine show that disk degeneration is only too common, increases greatly with each decade of life and quite frequently gives rise to minor or no symptoms.

On the other hand a stiff shoulder may develop in association with cervical disk pathology for the same reason as it frequently occurs in association with coronary disease. In these cases it is of neurogenic origin.

As regards conservative treatment, not nearly enough importance is attached to the practice of manipulation with traction. In skilled hands, this is a safe and most helpful procedure. There are certain contraindications for its use, and the main one is that it should not be used by the unskilled or unqualified. It is not helpful in those cases showing gross arthritis and disk degeneration. It is often a failure where motor signs are apparent and, of course, in those cases where compression of the cord shows pyramidal tract signs.

I should like to congratulate Geigy for giving the profession such a valuable publication. This, I think, is one of the most useful forms of advertisement that has yet been sent out by any company.

81 Collins Street,
Melbourne, C.I.
October 7, 1957.

Yours, etc.,
R. FRANK MAY.

LUMBAR PUNCTURE AND SPINAL ANALGESIA.

SIR: One cannot but wonder whether the over-all generous appraisal of this book is not the result of a cursory glance at the illustrations. Your reviewer is so much at fault with the only section he particularizes that it is difficult to believe that he has read it, or that he is an anaesthetist. He damns procedures he infers I have advocated, though in fact I haven't—and expresses, as though they were his own, views the book sets out quite clearly.

Thus on the question of a treatment of headache he writes: "It is unnecessary to inject fluid into the subarachnoid space . . . and such a procedure is extremely dangerous. . . ." The only sentence which could have evoked this comment is: "The intrathecal injection of saline affords passing relief, but, as a therapeutic measure, the procedure is not to be recommended. . . ."

The review proceeds: "The insertion of a catheter into the spinal theca and leaving it there are also contraindicated for the same reason, and also for another reason. . . ." Nowhere, of course, do I advocate this foolish procedure, nor can I imagine anyone in his senses giving it serious consideration.

After knocking over the Aunt Sallies he has set up himself, your reviewer volunteers his own ideas on treatment as though I have omitted to deal with the points he makes: "The treatment of headache following lumbar puncture is simple, effective and completely devoid of risk. It merely consists of elevating the foot of the bed on twelve-inch blocks and forcing the intake of fluids to six or eight pints or more per day. This is preferably done with the patient in the prone position, without a pillow, for as long as can be tolerated. The headache invariably disappears within a few days." In fact in this chapter I have written: ". . . the foot of the bed (should) be raised. . . . The patient should be encouraged to drink freely . . . the patient, for periods as long as he can bear, should lie prone with the head at a lower level than the buttocks." I mention that this regime promotes early healing of the hole in the dura, and "once this is accomplished any deficiency in the volume of cerebrospinal fluid is soon made good, and recovery is complete".

Yours, etc.,
ROBERT MACINTOSH.

Pembroke College,
Oxford,
England.
October 12, 1957.

[The reviewer comments as follows:

I have received the copy of Sir Robert Macintosh's letter which you forwarded to me. After reading the second paragraph in the author's letter, I would refer you to the author's book, page 127, paragraph 3, line 2, where the author writes, "the headache can be relieved immediately, though temporarily, by the intrathecal injection of saline". Later, on page 129, paragraph 2, line 4, he declares this procedure on the grounds that it made another hole in the dura. He did not even mention the danger of infection, which was the reason why I disagreed with the method.

With regard to his second complaint in paragraph 3, I must cry *touché*, for I read "extradural" as "intradural"; but my criticism still stands. From a neurosurgical point of view, it is equally dangerous and foolish to inject fluid into the extradural space as it is dangerous to inject fluid in the intradural space because of the risk of infection, which the author apparently does not consider. Leaving a catheter in position in the extradural space would greatly enhance such a risk. A neurosurgeon would never advocate such a procedure.

I do not understand his third complaint in paragraph 4, for I merely described, just as he described, the recognized method in treating low pressure headache. On this point I was entirely in agreement with him.]

AUTOMATIC SYRINGES FOR DIABETICS.

SIR: At the recent conference of the Australian Diabetes Federation, a number of the lay delegates recommended that greater use should be made of the automatic insulin syringe. From the personal experience of themselves and their fellow diabetics, they had found that the insertion of the needle was almost completely painless with this instrument, and the hesitancy of the timid beginner, especially the child, was more readily overcome. It was thought desirable to pass on this opinion to the medical profession, and we would be grateful if this could be done through the medium of your Journal.

Yours, etc.,
MILTON J. CHAMPION,
Honorary Secretary, Diabetes
Federation of Australia.

107 Bathurst Street,
Sydney,
November 11, 1957.

CERTIFICATES FOR FRIENDLY SOCIETY MEMBERS.

SIR: Some years ago the Journal carried an intimation to members of the British Medical Association that pads of certificates could be obtained from the Friendly Societies' Association for the purpose of issuing certificates to friendly society members. These certificates are issued free of cost, postage paid, and over the years have been dispatched to many members.

It is felt, however, that a reminder might be of mutual advantage both to the societies and the medical profession, and any action that can be taken or suggested would be appreciated.

Yours, etc.,

A. L. BARR,
Secretary, The Friendly Societies'
Association of New South Wales.

First Floor, Rechabite House,
85 Campbell Street,
Sydney.

November 15, 1957.

Obituary.

HUGO FLECKER.

We are indebted to Dr. I. A. Lester for the following account of the career of the late Dr. Hugo Flecker.

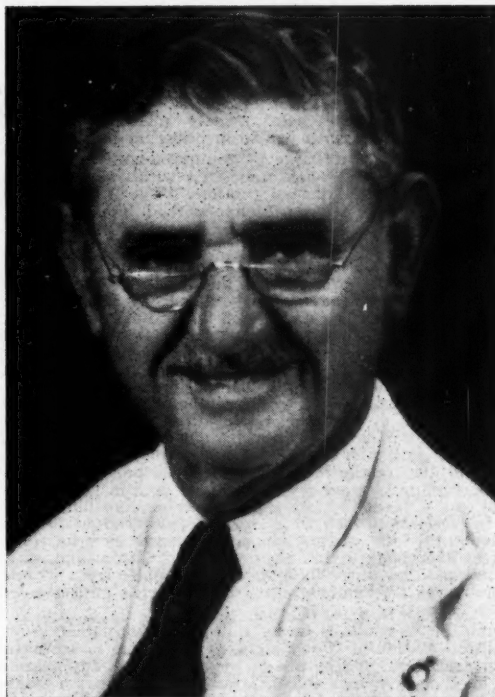
Hugo Flecker, M.B., Ch.M., F.R.C.S., L.R.C.P., F.C.R.A., F.F.R., D.R., was born in the Melbourne suburb of Prahran on December 6, 1884, and was educated at Prince Alfred College, Adelaide. He commenced his medical training at the University of Adelaide in 1904. After concluding his pre-clinical course, he moved to Sydney to complete the clinical years at the Prince Alfred (later Royal Prince Alfred) Hospital, graduating M.B., Ch.M. in 1908 with honours in anatomy. From the time of his graduation to the first World War he occupied a number of positions, including those of demonstrator in anatomy at the University of Sydney, honorary anaesthetist at the Royal Hospital for Women, and honorary physician at the Mater Misericordiae Hospital, North Sydney, and he spent a short period in private practice at Neutral Bay. During this period also he was overseas taking his F.R.C.S. (Edinburgh) in 1910. He enlisted in the first week of World War I, and served with the Light Horse in Egypt and the Field Ambulance in France. Later he was registrar of a base hospital in Helopolis, which was receiving Gallipoli casualties. Returning to Sydney in 1917, he commenced practice at Temora in New South Wales. Later, in 1921, he moved to Melbourne, where he commenced practice as a radiologist, there installing Australia's first deep therapy plant. He held honorary appointments in radiology at the Austin Hospital and the Homœopathic (later Prince Henry's) Hospital. He served on the committee of the former hospital and was responsible for its change of name from the Austin Hospital for Incurables to the Austin Hospital for Chronic Diseases. During this period also he held an appointment in X-ray anatomy at the University of Melbourne from 1927 to 1932.

In 1932 he moved to Cairns, and he gained the F.F.R. (England) in 1939 and the D.R. (Sydney) in 1937. Dr. Flecker obtained recognition for a number of works on radiological matters, in particular his monograph on the developmental anatomy of bones, which is now accepted as a standard work and still quoted in text-books on the subject. With Sir Albert Coates and Dr. Leon Jona he studied the movements of the shoulder joint and published a paper on this subject, and he was also responsible for a paper on the peristaltic action of the ureters. During the second World War he again enlisted and served as radiologist at the 116th Australian General Hospital, Charters Towers, with the rank of Major, 1942 and 1943.

Apart from his medical interest, Dr. Flecker was a keen naturalist, his interest in nature study beginning as a schoolboy in Adelaide, when he belonged to the Boys' Field Club and took a special interest in the study of shells on the Adelaide beaches. As a student in Sydney Dr. Flecker was a member of the Naturalists' Club of New South Wales and of the Sydney University Students' Science Club. Later during the Melbourne phase of his career he was a member of the Field Naturalists' Club of Victoria; but when he came to Cairns (one wonders if this move was influenced by the wealth of nature material available for study in the district), his interest in nature branched into many different directions, botany and marine life being perhaps those which attracted him most. He was foundation president of the North Queensland Naturalists' Club in 1932 and filled the office for thirteen years. He was a Fellow of the Royal Geographical Society. He was particularly interested in the "stinging marine objects" which still puzzle naturalists and clinicians in the Cairns district. He gave the name "Irukandji" to the organism (still hypothetical) which causes epidemics of severe abdominal pain, vomiting and

collapse amongst the bathers on northern beaches in the summer months. A jellyfish suspected of being the cause of another problem—namely, sudden death amongst bathers—was named after him *Chironex fleckeri*. Dr. Flecker published a number of papers on this branch of his subject. In other branches of biology two orchids, a moss and a crayfish are identified by his name. He was interested in the problem of optic nerve blindness, and proved that it was caused by eating the fruit of the finger cherry tree in some otherwise unexplained cases.

Dr. Flecker was also a prominent Freemason and a member of Legacy. He is survived by his widow, a son (Dr. Patrick O. Flecker, Medical Superintendent of Mareeba Hospital) and a daughter, and his death will be felt by his many medical friends and acquaintances.



Dr. C. H. Knott writes: Dr. Hugo Flecker was an outstanding character and an asset to the community as well as to the medical profession. Since he came to Cairns in 1932, he had devoted himself to his speciality, and he had received the support of his colleagues in Cairns and earned their respect. His reputation in radiological research had been made before he came to Cairns, and we were fortunate to be able to work with a man of such repute. He retained an active interest in his work right up to the time of his death, and even in his later years he possessed an alert mind which enabled him to give astute judgements on his work.

Afflicted in early life by nerve deafness, Dr. Flecker was not greatly inconvenienced by this. He was most exact in his work, and his frequent references to medical literature showed what an intense student he had always been. He always took an active part in clinical discussions and contributed a great deal of original thought. He was patron of the second North Queensland Medical Conference held in Cairns in 1956. He took an active interest in the proceedings, and read a paper on the effects of stings by marine organisms. The subject had always been the link between his normal vocation and his work as a naturalist.

Dr. Flecker assiduously collected records of fatal cases and of less severe syndromes caused by the stings of marine objects, and his contributions to this problem have been the subject of numerous articles both in *THE MEDICAL JOURNAL OF AUSTRALIA* and in the lay Press. A recent honour was conferred on him when the jellyfish concerned with the death of a person at Cardwell was found to belong to a new

order and species and was given the name *Chironex fleckeri*. Another original contribution was made when he gave the name "Irukandji" to another syndrome connected with an unknown marine object. The name refers to the original aboriginal tribe who were in the Cairns region.

Dr. Flecker's reputation as a naturalist had spread far and wide. He was an authority on the local flora and fauna, and much of his time was taken up in identifying plants or insects brought in by the public, or in answering inquiries by letter from people in the remote peninsular areas as well as from southern authorities. He was for many years president and then patron of the North Queensland Naturalist Society, whose monthly journal he edited until the time of his death. He also edited check-lists of North Queensland fishes, orchids and ferns in connexion with this journal. He founded the North Queensland Herbarium, and a large number of the specimens have been collected and then mounted and described by himself. In the earlier days he would frequently spend a week-end in a remote area with his collecting box, and each new discovery gave him immense pleasure.

Dr. Flecker's other hobby was philately, and this was pursued with the same intense interest. He took an active interest in the Philatelists' Society and carried on an exchange in stamps with people in other lands.

Dr. Flecker had the flame of genius burning brightly. It is an honour to have been associated with one whose fame had spread so much in his lifetime. Yet in spite of his concentration on matters which absorbed him so fully, he had time to devote himself to his family; he was kind to children and he was courteous to all people.

Mr. T. U. LEY writes: The death of Dr. Hugo Flecker has left a gap in the professional and cultural life of North Queensland—a gap that will be difficult to fill, as he contributed greatly to the dignity of his profession and to the natural history of this part of Australia. It was the fascination of our tropical vegetation and marine life that brought him to the north, and for many years he spent most week-ends climbing the neighbouring mountain peaks or exploring the shores of the lesser inhabited islands—seeking unusual forms of plant or marine life. It was one of the most pleasant moments of his life when the local municipal authorities gave him the use of a building wherein he could store and display the many specimens he had gathered, and this herbarium became even more dear to him when a heart attack put an end for all time to his explorations, and he had to be content with what other people brought in to him for identification. In his own quiet, gentle way he tried to interest everybody in the native flora of Queensland, and he enjoyed nothing more than to be surrounded by a group of people while he demonstrated the tentacles of a sea-wasp or the texture of a cedar leaf.

Hugo Flecker was just as thorough and painstaking in his interpretation of X-ray pictures as he was in his natural history research, and he always regarded an X-ray examination as a radiological consultation. He was never content to post a report of his findings, but whenever possible would bring the films to the doctor for discussion, and after listening to his interpretation of the films one could not help but be impressed with his profound knowledge of X-ray diagnosis. Hugo Flecker was one of the few purists in the profession, and Shakespeare's "What's in a name?" had no place in his conversation or writings. He demanded that everybody and everything be properly addressed, and I can well remember him at one medical meeting attacking a speaker for daring to call a fracture-dislocation of the ankle a Pott's fracture. He would have been horrified if he had known that he was always affectionately referred to as "Fleck" within the profession.

His memory and his personality must never be allowed to fade away, and I hope that some small part of our vast hinterland will be left completely undisturbed as a perpetual memorial to a great and simple man.

Royal Australasian College of Surgeons.

FINAL FELLOWSHIP EXAMINATION.

THE next meeting of the Court of Examiners for the final examination for Fellowship of the Royal Australasian College of Surgeons will be held in Melbourne, beginning on Friday, May 2, 1958. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Censor-in-Chief for permission to do so

before March 20, 1958. The appropriate forms are available from the Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.I., Victoria. Candidates who have already been approved by the Censor-in-Chief, but who have not yet presented themselves for the examination, may do so at this examination, provided that they notify the Secretary of their intention to do so by March 20, 1958. It is stressed that entries close on this date and that late entries cannot be accepted. The examination fee is £26 5s., plus exchange on cheques drawn on banks outside Melbourne, and must be paid to the Secretary by March 20, 1958.

The examination will be conducted in general surgery, and in the special branches of ophthalmology, laryngo-otology, gynaecology, and operative obstetrics, orthopaedics, urology, neurosurgery, plastic surgery, thoracic surgery and paediatric surgery.

At its meeting held on June 23 and 24, 1956, the Council decided that until December 31, 1958, Fellows of other Colleges with which the Royal Australasian College of Surgeons has reciprocity of primary examinations, and who obtained their Fellowship prior to January 1, 1950, may, at the discretion of the Council, be permitted to undergo a modified type of final examination. The conditions set out above regarding method of application for permission to present, date on which entries close, examination fee etc., also apply to the temporary modified type of final examination.

FACULTY OF ANÆSTHETISTS.

Final Fellowship Examination.

A MEETING of the Court of Examiners for the final examination for Fellowship of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons will be held in Melbourne, beginning on Friday, May 2, 1958. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Assessor for permission to do so before March 20, 1958. The appropriate forms are available from the Secretary of the Faculty of Anæsthetists, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.I., Victoria. It is emphasized that entries close on March 20, 1958, and that late entries cannot be accepted. The examination fee is £26 5s. plus exchange on cheques drawn on banks outside Melbourne, and must be paid to the Secretary by March 20, 1958.

The subjects for the final examination are as follows: (a) anæsthesia and analgesia, including pre-operative and post-operative care; (b) medicine and surgery; (c) the application of the basic sciences, including chemistry and physics, to the specialty of anæsthetics. The examination in each case is partly written, partly oral and partly clinical (including the examination of patients).

Graduates of an approved medical school who have obtained, prior to December 31, 1957, the first part of the diploma in anæsthetics of an approved medical school or college, may, at the discretion of the Board, be allowed to proceed to the final examination of the Faculty, provided that they have fulfilled all other regulations.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, in accordance with the provisions of the *Medical Practitioners Act, 1938-1957*:

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1b) of the Act: Knight, Dennis Edward William, M.R.C.S. (England), L.R.C.P. (London), 1950, D.T.M. & H. (England), 1952; Stephenson, Pat Elizabeth, M.B., B.S., 1953 (Univ. Durham).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (2b) of the Act: Jackus-Jackevicius, Boris, M.D., 1937 (Univ. Kaunas); Janousek, Marie Jaroslava, M.D., 1932 (Univ. Bratislava); Meszaros, Charles, M.D., 1937 (Univ. Budapest); Saave, Jan Jerzy, M.D., 1948 (Univ. Marburg).

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Ophthalm
Ornithosi
Paratyph
Plague
Polioomye
Puerpera
Rubella
Salmonell
Scarlet F
Smallpox
Tetanus
Trachoma
Trichinos
Tuberculo
Typhoid
Typhus
Tick-bo
Typhus
Yellow F

Fig

Registered medical practitioners who have been issued with licences under Section 21c of the Act: Chariw, Peter, M.D., 1947 (Univ. Vienna); Gottl, Frederick, M.D., 1925 (Univ. Budapest); Heyko-Porebski, Jan Antoni, M.B., 1936 (Univ. Posnan); Kroll, Endel, M.D., 1943 (Univ. Tartu); Majewski, Stanislaus, M.D., 1934 (Univ. Smolensk); Ropicki, Lydia, M.D., 1948 (Univ. Graz).

TASMANIA.

THE following have been registered, pursuant to the provisions of the *Medical Act*, 1951, of Tasmania, as duly qualified medical practitioners: Scargill, Sam Waterhouse, M.R.C.S. (England), L.R.C.P. (London), 1952; Turner, Harold Montagu, L.R.C.P. (England), M.R.C.P. (London), 1953.

The following have been granted special licences for one year under the *Medical Act*, 1951: Gratz, Otto Gustav Henry, M.D., 1939 (Univ. Szeged); Sticher, Christian August, M.D., 1936 (Univ. Bonn).

The College of Radiologists of Australasia.

ANNUAL MEETING.

THE eighth annual meeting of the College of Radiologists of Australasia was held on October 21 to 25, 1957, at Perth.

The following office-bearers were elected: *President*, Dr. M. G. F. Donnan; *Vice-President*, Dr. R. Kaye Scott; *Honorary Secretary*, Dr. E. A. Booth; *Honorary Treasurer*, Dr. D. B. Wightman.

Dr. W. S. C. Hare was chosen as the Baker Fellow for 1958.

The Röntgen Oration, entitled "Medicine and Society", was delivered by Professor E. G. Saint. This will be published in full in a subsequent issue of the Journal.

Congresses.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE.

ATTENTION is once more drawn to the fifth International Congress of Internal Medicine, to be held at Philadelphia on April 24 to 26, 1958. Some indication of the scope of the congress was given in the issue of this Journal of August 10, 1957, at page 227. Those requiring further information should write to the Secretary-General at 4200 Pine Street, Philadelphia 4, Pa.

Naval, Military and Air Force.

APPOINTMENTS.

THE following appointments, changes etc. have been promulgated in the *Commonwealth of Australia Gazette*, No. 58, of October 24, 1957.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Termination of Appointment.—The appointment of the following is terminated on reversion to the Royal Navy: Surgeon Lieutenant-Commander William Bearn Wilder, dated 2nd August, 1957.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Transfers to the Retired List.—Surgeon Lieutenant-Commander John Patrick Millar is transferred to the Retired List, dated 22nd August, 1957.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED NOVEMBER 9, 1957.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1(1)	2(2)	5(3)	2(2)	..	..	..	..	10
Amoebiasis	1(1)	..	..	..	1
Ancylostomiasis	1	..	..	..	..	..	1
Anthrax
Bilharziasis
Brucellosis
Cholera
Chorea (St. Vitus)	1(1)	..	..	..	..	..	..	1
Dengue
Diarrhoea (Infantile)	5(3)	12(11)	6(6)	..	..	..	4	..	27
Diphtheria	1	..	..	..	..	..	..	..	1
Dysentery (Bacillary)	2(2)	3(2)	..	..	..	..	..	5
Encephalitis
Filariasis
Homologous Serum Jaundice
Hydatid
Infective Hepatitis	36(26)	16(6)	5	12(12)	2(1)	1(1)	..	1	73
Lead Poisoning
Leprosy	3	..	3
Leptospirosis
Malaria
Meningococcal Infection	4(3)	3(2)	1(1)	..	..	2	..	..	10
Ophthalmia
Ornithosis	1(1)	..	..	..	..	1
Paratyphoid
Plague
Polymyositis
Puerperal Fever
Bubelia	71(61)	23(14)	36(22)	22(20)	..	..	1	155
Salmonella Infection
Scarlet Fever	3(2)	7(7)	4(3)	4(3)	2(1)	..	..	..	20
Smallpox
Tetanus
Trachoma	7(1)	..	1	..	8
Trichinosis
Tuberculosis
Typhoid Fever	42(21)	20(9)	23(11)	4(3)	7(5)	5	..	..	101
Typhus (Flea-, Mite- and Tick-borne)
Typhus (Louse-borne)
Yellow Fever

¹ Figures in parentheses are those for the metropolitan area.

Notice.

SPECIAL GROUP ON AVIATION MEDICINE (BRITISH MEDICAL ASSOCIATION).

THE eighth annual general meeting of the Special Group on Aviation Medicine (British Medical Association) will be held at 8 p.m. on Tuesday, December 3, 1957, at 49 Mathoura Road, Toorak, Melbourne. An address will be given by Squadron Leader J. McC. Morrison, R.A.A.F., on "The Doctor and the Flier in Canada and the United States".

RADIATION SOCIETY.

THE next meeting of the Radiation Society will be held at 5.30 p.m. on Tuesday, December 10, 1957, in the Lecture Theatre, Cancer Institute, 483 Little Lonsdale Street, Melbourne. Dr. J. H. Martin will read a paper entitled "Hazards of the Medical Use of Ionizing Radiations". The Convener of the Radiation Society is Dr. J. H. Martin, care of the Cancer Institute Board at the above address.

SUMMER CAMP FOR DIABETIC CHILDREN.

THE Association of Summer Camps for Diabetic Children announces that the annual camp will be held from January 11 to 25, 1958. Any diabetic boy or girl aged between six and thirteen years is eligible to attend. Information may be obtained from the Honorary Secretary, Miss R. Pirie, c/o Dietitian's Office, The Royal North Shore Hospital of Sydney, St. Leonards. Telephone: JF 0411, extension 302.

Medical Appointments.

Dr. E. J. B. Trembath has been appointed Medical Officer, Mental Hygiene Branch, Department of Health, Victoria.

Dr. Ian Atkinson has been appointed Medical Officer, Mental Hygiene Branch, Department of Health, Victoria.

Dr. D. W. Johnson has been appointed a member of the Queensland Health Education Council.

Dr. E. V. Knight has been appointed Senior Medical Officer, State Government Insurance Office, Brisbane, Queensland.

Dr. B. Monz has been appointed Government Medical Officer at Murgon, Queensland.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Morgan, Gerald John, M.B., B.S., 1956 (Univ. Sydney), 7/15 Wellington Street, Bondi, New South Wales.

Reichardt, Julius Emery, M.D., 1940 (Univ. Cluj, Rumania) (licensed under Section 21c of the *Medical Practitioners Act, 1938-1957*), 58 Cronulla Street, Cronulla, New South Wales.

Schultheisz, Ladislaus Karl, M.D., 1924 (Univ. Budapest) (licensed under Section 21c of the *Medical Practitioners Act, 1938-1957*), 81 Staples Street, Kingsgrove, New South Wales.

Szechowicz, Bohdan, M.D., 1950 (Univ. Erlangen) (licensed under Section 21c of the *Medical Practitioners Act, 1938-1957*), 4 Percy Street, Auburn, New South Wales.

Spencer, Owen Lisle, M.B., B.S., 1954 (Univ. Sydney), 22 Euroka Street, Northbridge, New South Wales.

Deaths.

THE following deaths have been announced:

ALLSOP.—Leslie Thomas Allsop, on October 27, 1957, at Sydney.

WUNDERLICH.—Theodore Wunderlich, on November 14, 1957, at Balmain, New South Wales.

BINNS.—William Johnstone Binns, on November 20, 1957, at Kogarah, New South Wales.

Diary for the Month.

Nov. 30.—New South Wales Branch, B.M.A.: Country Branch Meeting at Katoomba.

Dec. 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.

Dec. 4.—Victorian Branch, B.M.A.: Branch Meeting.

Dec. 4.—Victorian Branch, B.M.A.: Branch Council.

Dec. 4.—Western Australian Branch, B.M.A.: Branch Council.

Dec. 5.—New South Wales Branch, B.M.A.: Clinical Meeting.

Dec. 9.—Victorian Branch, B.M.A.: Executive of Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

Queensland Branch (Honorary Secretary, 88 L'Estrange Terrace, Kelvin Grove, Brisbane, W.1): All applicants for Queensland State Government Insurance Office positions are advised to communicate with the Honorary Secretary of the Branch before accepting posts.

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